THE UNIVERSITY
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Confluences
Folk wisdom in contemporary music

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Declaration

I hereby declare that I am the only author of this thesis. Contributions of others are indicated clearly, with reference to the literature or acknowledged otherwise. The work contained in this text has not been submitted for any other degree or professional qualification.

(Christian Ferlaino)

Abstract

This thesis explores ways of adopting elements of Calabrian folk music in compositions of contemporary music beyond the mere adoption of melodies and instruments. Through this work, I aim to create a practice for contemporary improvisation and composition that is deeply imbued with elements derived from the music theory, the sonic environment and the performance practices of Calabria.

The work described in this dissertation consists of two components: ethnomusicological research and a practice-based enquiry. This research focuses mainly on three aspects of Calabrian folk music: generative principles, the tuning system and processes of bagpipes, and soundscapes created by animal bells. These aspects guided both the ethnomusicological enquiry and the creative exploration. They are first described and analysed in their original context: folk music was studied in the field, amid and within the tradition bearers; research was conducted from a cultural and musicological perspective within the methodological and ethical framework of ethnomusicology. The data emerging from the ethnomusicological investigations informed the creative enquiry carried out through practice-led research. The outcomes of my investigation into Calabrian music became the core principles of my compositions of contemporary music. Generative principles were explored from the perspectives of both composition and improvisation They informed primarily a series of pieces for saxophone solo and a composition for chamber ensemble. The tuning system and processes of Calabrian bagpipes were investigated in compositions centred on pitch and extended harmonic spaces. They informed two compositions for string quartet and a piece for saxophone quartet. Soundscapes informed the composition of a piece of spatial music for goat bells that adopts indeterminacy methods for structuring the performance. The creative work, attached to this thesis as a portfolio of compositions, is analysed through self-reflective methods and in relation to the work of other contemporary music practitioners.

My enquiry of the folk sources contributes to the field of ethnomusicology with new insight into Calabrian music. The creative processes and the techniques developed throughout this research also have implications for the broader field of contemporary music, as they offer a perspective on new ways of engaging creatively with folk materials.

Lay Summary

This thesis discusses the use of structural and cultural elements of Calabrian folk music as a resource for the composition of contemporary music. My work aims to create a practice for contemporary music that is deeply imbued with elements derived from the music theory, the sonic environment and the performance practices of Calabria. This objective is achieved both through analytical and practical research: the outcomes of research into Calabrian music inform the composition of original music.

This thesis describes all the stages of such research, from the investigation into folk music to the application of its outcomes to the composition of new music. I researched music in Calabria, in Southern Italy, through ethnographic and ethnomusicological methods: I interviewed musicians, recorded music and participated in and observed occasions in which music plays a central role. In my studies of Calabrian music, I also drew on my experience as a musician trained in that folk tradition.

I used the outcomes of that research as the fundamental musical materials of the music I composed throughout the doctorate. I composed six pieces of contemporary music which involve improvisation together with written and indeterminate scores. These pieces explore the following topics: the generative principles of Calabrian dance music; the peculiarities of the local bagpipes, especially regarding the instruments' tuning system and repertoire; the cultural significance attributed by shepherds to the sound of goat bells. This research shows how a thorough understanding of folk music can inspire a creative exploration into contemporary music.

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I am neither mathematician nor economist, but perhaps I am not mistaken when I declare that if the money spent in one year on armaments all over the world were allocated to musical folklore research, we could collect the folk music of the entire world (Bartók and Suchoff 1992).

Chapter 1
Introduction

1.1 Folk music as a resource for contemporary music

Music folklore has often been an important source of inspiration for composers and improvisers, whether for the outline of specific techniques or the development of a whole musical language. Music practitioners have been drawing on European and non-European folk music throughout the entire history of Western music. Peter van der Merwe (2004) traces an account of the influence of folk music on classical music. His book highlights the connections between these musics, from the Baroque to the Modern era, and describes how classical music borrowed modes, harmonic solutions and melodies from folk music over the course of four centuries. Matthew Gelbart (2007) tracks a similar history aimed at demonstrating how the line that separates the two genres of "classical" and "folk" is less defined than is usually thought. With the rise of the modern nations in the 19th century, romantic composers associated the adoption of folk music with political instances. At the turn of the 20th century, a new path is established. Forefather of ethnomusicology Béla Bartók is probably the most renowned composer to establish in his music a profound connection with folk sources. The rigour of his research and the in-depth adoption of elements derived from folk music made him the prime example of composers who embraced that area of investigation.

The fascination with folk music can also be traced in American and European composers throughout the 20th century until the present day. For instance, Harry Partch's instruments show evident borrowings from different musical traditions (Griffiths 2010; Granade 2014). Lou Harrison draws from diverse non-Western traditions, Gamelan music above all (Griffiths 2010). Korhonen (2000) describes a young school of Finnish contemporary composers who have consistently drawn on their folk music heritage. Walter Zimmermann draws on Franconian music for his *10 Fränkische Tänze,* re-orchestrating the traditional tunes using only natural harmonics in a string quartet (Gottschalk 2016). The continuous steady drumming of Native American ritual music informed the philosophical and theoretical foundation of Anthony Braxton's *Ghost Trance Music* (Haring 2011). Chinese-born composers,

or composers from Chinese origins, such as Tan Dun (Rochester 2016) or Chen Yi (Shaw 2015), have consistently drawn on Chinese traditional music in their works. South African composer Andile Khumalo's works draw on the timbral and spectral features of African music and instruments.

The research presented in this thesis can be positioned in the wake of the musical investigations presented above. With this research, I attempt to construct a practice for composition and improvisation informed by Calabrian folk music. Calabria is a southern Italian region, and is among the richest in traditional music and instruments (Scaldaferri 1994). Its lively folk music shows a peculiar theory and specific repertoires, musical instruments and performing techniques that have not been investigated to date from the perspective of the creative musician. This research originated from the supposition that music would provide constant stimuli to the development of a personal style as a composer and an improviser. Furthermore, as a bi-musical (Hood 1960) person, trained both as a Western and a folk musician, this research would also contribute to bridging my two musical identities.

The central focus of this research is the making of new music derived from elements of the sound and musical realm of Calabria, beyond the mere adoption of melodies, modes or instruments. Far from attempting a world-music fusion of these two traditions, my research aims at developing a practice from Calabrian techniques, conceptual frameworks, vocabulary, performance practices and soundscapes. By following Bartók's (2010) recommendation to the modern composer for doing first-hand field research, I have conducted extensive ethnomusicological research in Calabria. The outcomes of that enquiry have served as data for my creative investigations and have been incorporated into my musical practice. The making of new music, being achieved mostly in practical terms, positions this work within the framework of practice-led research. On the other hand, the collection of the source materials to be adopted in that process is achieved in theoretical and analytical terms by drawing on qualitative methods.

Because of its dual nature, focused on these two diverse areas of enquiry and centred around two different research frameworks, this research required the adoption of two distinct sets of methodologies. As practice-led research, the creation of contemporary music is conducted within the framework of reflection-in-action (Schön 2008). As I will describe, this process relies on both established composition practices and on newly generated and bespoke ones tailored to respond to specific

problems arising during the research. It draws on the knowledge and experience I gained as a performing musician, a composer and an improviser. The study of Calabrian music is epistemologically rooted in ethnomusicology and draws on related methods of enquiry such as auto-ethnography and acoustemology. This theoretical and analytical enquiry is directed to the understanding of Calabrian sonic and musical phenomena for the acquisition of data and source materials to be explored in the practice-based research.

1.2 Motivation

The core methodology of this study sits within that of practice-led research, which is research initiated in and carried out through practice. The “questions, problems, and challenges are identified and formed by the needs of practice and practitioners” (Gray 1996, 3). The questions emerging within my practice as a composer and improviser became the basis for undertaking further enquiry from a research perspective. The ultimate questions and challenges that drive research in composition are the making of new music and the development of new musical practices. In my particular case, the specific challenges and questions have been defined within the study of the sonic environment and musical practices of Calabria and in the application of the outcomes of that enquiry in the musical realm of contemporary music. My personal experience both as a folk-trained musician and a Western-trained saxophonist, composer and improviser laid the ground for the research needs. As a folk musician, I was trained according to the method traditionally adopted in Central Calabria – where I was born and raised – based on imitation. Professional musicianship in folk music is uncommon in Central Calabria, where sound and music have a social and participatory function. Musical training is not formalised in a vertical teacher–apprentice relationship. It happens “in the field”, in a context of oral tradition through an informal and horizontal relationship, in which the training musician follows and imitates expert musicians, occasionally receiving “corrections” and advice (Ferlaino 2017). Within that method, I grew up in an environment that is characterised by proper and distinct practices, a peculiar generative musical grammar, a relational network, and a system of symbolic meaning associated with sound and music.

At the same time, I have been trained with the methods of Western musical institutions as a saxophone player. I started as a self-taught jazz player and improviser, and I then received private tuition in saxophone before ultimately joining the course in jazz at the Conservatory in Bologna. There, I studied jazz composition and idiomatic improvisation. I have been playing jazz, improvised music and free improvisation for almost two decades, participating in European improvisation scenes in Bologna, Amsterdam and Edinburgh.

For years, being bi-musical (Hood 1960) resulted in the perception of a divided musical-self, in which two separate and divergent musical identities coexisted. In fact, my knowledge of Calabrian music and my being a folk musician had been at odds for a long time with my professional practice as a contemporary, Western-trained musician. As a practitioner, I felt disconnected from the folk musical tradition I was part of. At the same time, I was afraid that a superficial and non-thoughtful adoption of melodies or other musical materials from Calabrian music would lead to an exploitation of my folk legacy, giving way to some kind of self-cultural colonialism. Cultural colonialism is described as the application of models of interpretation of one (dominant) culture to the processes, artefacts and theoretical structures of a different one. This process of cultural appropriation, especially in relationship to art, thrives on notions of the "extra-historicity of art and the Eurocentric bias of our thinking on culture" (Coutts-Smith 2002, 2). It consists of the "imitation of foreign languages, customs, and feelings, that is, in the absolute loss of the national idiosyncrasy" (Gay 1974, 154).

Along with my musical activity, I graduated in ethnomusicology and organology with a master's dissertation on dance music in Central Calabria. My research activity on Calabrian musical culture has continued for over a decade. It culminated with the publication of a monograph on dance music in the area attracted by the Pilgrimage to the Madonna di Conflenti (Ferlaino 2017), a collaborative work on the music of the valley of River Savuto (Bressi et al. 2017), and the constitution of a group that aims at researching and disseminating Calabrian music through workshops and conferences. In my quest for bridging my musical identities, I resolved that my background as an ethnomusicologist and my long-lasting research activity in Calabria would serve as a methodological and ethical framework for my creative exploration. Thus, my researcher self would contribute to bridging my artist and my folk musician selves. A rigorous ethnomusicological methodology would serve as a

controllable research framework for the study of the data subsequently adopted in my creative enquiry.

1.3 Research questions

The exploration of all the possibilities offered by Calabrian folk music in contemporary musical practice is a vast research territory, a comprehensive investigation of which would require decades of work. Such an enquiry would immensely exceed the limits of doctoral research for it to produce thorough and exhaustive outcomes. For this reason, I narrowed the work conducted throughout the triennium to the investigation of specific areas of enquiry identified within that research field. Hence, the work undertaken throughout the doctorate, and presented in this thesis, addresses a series of questions that emerged from three main areas of enquiry: Calabrian generative principles, the syntax of bagpipe tuning, and soundscapes.

In this text, I adopt the terms grammar and syntax to refer to aspects of Calabrian music. The use of linguistic terms in musical discourses are often problematic and need some clarification. For instance, Lerdahl and Jackendoff (1983), building on Chomsky's linguistic research, use this term to define a set of rules specifically generated to test cognitive instances of tonal music that relate the surface structure of a piece to the one perceived by the listener. In a different paper, Lerdahl (2001) also distinguishes between "natural" and "compositional" grammars. According to him, the former "arises spontaneously in a musical culture", betraying an approach that seems to attribute musicians and listeners limited agency in bringing change to their culture. In my dissertation, I use the term grammar as a synonym of generative principles, referring to the culturally acquired system through which musicians from the area organise sound into structures that are meaningful for them. With the term syntax instead, I refer to the way sound is systematised into broad categories, for instance, the choice of specific scalar systems or modes, or the arrangements of the sounds in a musical instrument.

Research on generative principles addresses the study and adoption of Calabrian musical grammar. This study focuses exclusively on the generative principles of dance music. Those processes are studied and explored within both

determined compositions and framed improvisations. The following questions emerged in this area of investigation:

- Is it possible to recreate the generative principles of folk dance music into a practice for contemporary improvisation?
- How can Calabrian processes of variation inform the composition of contemporary music?

Research into bagpipes' syntax was mainly concerned with the instrument's tuning system and process. These aspects were explored in compositions for ensemble. The following questions drove this enquiry:

- Can the tuning process of a bagpipe be considered a musical activity? If so, how to translate it into a musical process for contemporary music?
- Could these principles be adopted in the context of ensemble improvisation, and which strategies should be adopted?
- Which tuning system should be utilised to write music informed by Calabrian bagpipes?

Research into Calabrian soundscapes was concerned mainly with the sound of bells for herd animals. The following questions drove the enquiry into this area:

- Can the processes at play in Calabrian animal bells be considered musical?
- How to write music for animal bells that recreates Calabrian soundscapes?
- Which composition strategies could translate those soundscapes into a piece for medium-large ensemble?

I approached the questions presented here from the perspective of a performing composer and an improvising musician. They informed both the development of a personal musical practice as an improviser and performer and the creation of a vocabulary of compositional strategies. The problems arising in this enquiry were examined in free and framed improvisations, compositions for improvisers, and performance-oriented compositions.

1.4 Thesis overview

This section provides an overview of thesis structure and describes the particular research problems addressed in each chapter. The research described in this thesis has two distinct focuses: a musicological enquiry and a creative component. Consequently, the structure of the thesis reflects this duality of focuses. A first part describes the ethnomusicological research in Calabrian music, the methods of enquiry adopted and the data emerging. A second part describes the creative process, the theoretical framework in which the creative research took place and the musical outputs.

1: Introduction introduces the research objectives, describes the motivations driving this enquiry and defines the research questions. It also defines the phonetic system adopted for translating vernacular names.

2: Folk music enquiry describes the theoretical framework for the research into Calabrian music. It also described the methods of enquiry adopted and provides an overview of the data collection process.

3: Calabrian music describes the outcomes of the ethnomusicological research. They are divided into three main parts, each addressing a specific characteristic of Calabrian music and its sound environment. The three areas, discussed in their original context, are: *economy of means* and *generative principles*, *bagpipe tuning*, and *bells*.

4: Creative practice defines the theoretical framework and methodology for the practice-led research. It proposes an encompassing definition of contemporary music that establishes the context for the musical outcomes and describes the different contemporary musical sources that informed the research. It also discusses how the concepts of variation found in Calabrian music relate to the improvisational processes adopted in my music-making.

5: Musical outcomes describes the music composed throughout the research. It shows how the data that emerged in the ethnomusicological enquiry were translated into the core materials around which the compositions revolve. To some

extent, this chapter reflects the tripartition of the research questions: it discusses how the outcomes relate to each of the three specific area of enquiry identified previously.

6: Conclusion evaluates the work conducted and addresses potential directions for future research.

Appendixes lists the musical and theoretical works produced throughout the research and traces the history of their dissemination.

1.5 Transcribing vernacular names

Calabrian dialect is mostly a spoken language, with phonemes that are absent in spoken Italian. Written renderings of Calabrian vernacular have drawn on a wide variety of transcription methods, most of which are self-made. In the absence of a standard method widely adopted in the literature about Calabria, or in vernacular poetry, for the transcription of the vernacular terms employed in this thesis, I opted for Gerhard Rohlfs' phonetic transcription (Rohlfs 1982) of Calabrian dialect. Calabrian vernacular literature offers too wide a variety of transcription methods while Rohlfs' work on the regional language, although not completely up to date with the advancement of phonetics, still stands as the most complete and systematic attempt to accomplish this task. I will replace Rolfs' phonetic sign ḍ with đ, for it has become an established practice in many ethnomusicological publications on Calabria.

Throughout the thesis, I will refer to folk music pieces with the vernacular word *sunata* – which refers generically to a piece of instrumental music – or more extensively with the terms *sunata d'abbađđu* or *sunata ppe abbađđare*, which are the terms used explicitly for dance music. I will adopt the short version to refer to both dance and instrumental music. When referring to dance music, I avoided using the term *tarantella*, also sometimes found in the area, for it commonly presents a misleadingly unifying view of South-Italian music (Castagna 2006). Furthermore, *tarantella,* besides being sometimes used to refer to a generic dance piece associated with the dance form *a tarantella*, in this area also identifies a specific *sunata* for *organetto*.

Chapter 2
Folk Music Enquiry

This chapter delineates the conceptual frameworks in which the research has been conducted and describes the methodologies adopted for data collection and analysis. Epistemologically, this enquiry has its roots in ethnomusicology and draws on ethnographic methods. Methodologies from related disciplines, such as auto-ethnography and *acoustemology*, are also called on. After defining the disciplinary context, I will describe the music-analytical methods adopted and discuss the theoretical framework that served the interpretation of Calabrian music variation processes. Finally, I will describe the data collection process and briefly introduce the themes that emerged in the ethnomusicological enquiry.

2.1 Ethnographic methods

Understanding folk music is a difficult task for the researcher, for there is not always an accessible documented history to which to refer. Furthermore, there are no explicit rules, or authors, providing a clear theoretic system for the music to be studied (Magrini 1988). The researcher's only accessible document is the performance, in which creation and interpretation blend in a way that is entirely neglected by Western musical practices based on writing and scores (Brailoiu 1978). Understanding folk music requires close contact with the tradition bearers. One must look into the performance, access different performances to spot consistency and divergence, and read between the lines to grasp how musical phenomena are verbalised, in a constant dialogue with the people who produce that music.

The folk music phenomena at issue present distinctive characters that require a thorough understanding of the indigenous theoretical, social and symbolic processes. Such an understanding can be achieved only by studying the community that produced that music. Qualitative research studies "things in their natural setting, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them" (Denzin and Lincoln 2005, 3). Research on Calabrian music

was conducted in accordance with the paradigm expressed above. To study that music in its social context required the adoption of multiple methodologies, in order to add "rigor, breadth, complexity, richness, and depth" (Denzin and Lincoln 2005, 5) to the enquiry. Data collection and analysis were achieved mostly through qualitative research, by drawing on ethnographic methods. The research process involved participant observation, interviews, field recordings and music analysis, as well as bibliographical and archival research.

As Bartók (1992) pointed out, the understanding of folk music requires a close contact with the actors of that tradition. Similarly, Atkinson and Hammersley assert that:

> Ethnography usually involves the researcher participating, overtly or covertly, in people's daily lives for an extended period of time, watching what happens, listening to what is said, and/or asking questions through informal and formal interviews, collecting documents and artefacts – in fact, gathering whatever data are available to throw light on the issues that are the emerging focus of enquiry. (Atkinson and Hammersley 2007, 3)

Lofland (2006) points out that participant observation and in-depth ethnographic interview go hand in hand. The unstructured interview format (Fontana and Frey 2005) relies on an open-ended conversational approach and takes place in the "dialogic space between the Self of the researcher and the Other world of the person being researched" (Saukko 2005, 348). While structured interviews aim "at capturing precise and codable data so as to explain behaviour within pre-established categories", unstructured ones attempt to understand the complex behaviour of members of society without "imposing any a priori categorisation that may limit the field of enquiry" (Fontana and Frey 2005, 706). Using questionnaires and structured interviews as a method of enquiry for this research would have had the upside of maximising the collection of information in a shorter time. On the other hand, as I was aiming at understanding the emic theory of music and the functioning of *musicking* (Small 2011) in the region, structured interviews would have pressured the interviewee into verbalising what is usually non-spoken knowledge or at least knowledge that is not verbalised in a structured way. For these reasons and because of my special position both as a researcher and a member of that musical community, I opted for a dialogical and discursive method of enquiry.

Italian anthropologist and musicologist Antonello Ricci maintains that a formal relationship between the researcher and the person being researched could produce an incomplete picture: persons known only in the formal setting of a work

relationship always offer a sparkling image of themselves (Ricci 2016). In many cases, a person does not offer up their true self before having established a trustworthy and durable relationship (59). An enquiry in the sonic and musical world must revolve around the act of listening and keep in high consideration the way the person being researched perceives and codifies sound. Resorting only to observation would not give a complete picture of aural phenomena, which can be understood only through listening. Therefore, listening together and listening to each other become a fundamental method of enquiry. Antonello Ricci (2016) defines this approach to research as *participant listening*: it parallels participant observation and relies on the human participation of the researcher in the research process through the act of listening. It privileges the mutual relationship established through listening, conversation and participation in common actions. This way, it seeks to reduce the objectification of the "researched" in favour of a reciprocal, dialogical and more human relationship, in which the researchers offer something of themselves in the process.

With existing and ongoing relationships, this often means participating in the daily life of the community. With new contacts and yet-to-be-established relationships, the process is slower and requires time to win the trust of the subjects. First of all, to access the house of a folk musician and establish a first contact, I had to be introduced by a common acquaintance, who was usually present during the initial visits. The presence of a trusted person induced a slow thawing that allowed the participants to remove their concerns that I could be there to "steal their knowledge". As the relationships grew, I was welcomed as a relished guest and a friend. I was, and still am, invited to their houses for a meal, for special celebrations – such as the slaughtering of an animal – or just for a chat and a glass of wine. They were keen to tell and eager to listen. Thanks to a constant dialogue and a truly participated human relationship, I accessed the "most intimate level of communicative competence", to use a concept borrowed from linguistics (Ricci 2016).

Interviews were concerned with gathering cultural information and aimed at accessing the emic view on music and sound. The information sought would define an analytical framework for interpreting the phenomena observed in a way that could reflect the indigenous point of view. I was seeking to avoid the application of Western musicological categories in search of an analytical framework that would better fit the cultural phenomena I was studying.

In the interviews, I followed a flexible protocol which allowed the participants' voices to lead, and subsequently transcribed the salient points of the recorded interviews. I wrote down in field notes important information that came up in day-to-day conversations. I then analysed the data in order to identify specific themes. The themes that emerged consist of:

- Technical aspects
- Training methods
- Social setting for music-making and reception
- Repertoire
- Approach to sound and music
- Instruments
- Tuning
- Bells for herd animals and pastoral sound environment.

In general, the interviews showed a considerable agreement among the participants. The information regarding the use of bells in herd animals was confirmed by all the interviewee, as all participants depicted a very similar use of this sound device. I recorded also a very large consensus within the interviewee concerning the repertoire for accordion. Small divergence was recorded in regional variants of some of the *sunate's* names. Interviews concerning the repertoire for bagpipes produced rather large discrepancies, mostly regarding the names associated with the various *sunate*. A similar fragmented scenario is recorded also by Vincenzo La Vena (2005), who attributes the loose relationship between sunate for bagpipes and their relative names to the weakening of the relationship between the pieces and the associated dances. Information concerning the variation principles was confirmed by a large majority of the participants, as well as by many informants and listeners.

These themes guided the analysis of the cultural artefacts – namely music recordings and music instruments – that were studied in the course of this research. The information that emerged is used in support of the interpretation of the musical phenomena discussed throughout the thesis and was fundamental for defining the methods adopted for analysing the music recorded. The themes were coded in three main areas of investigation: generative principles, tuning systems and sound organisation of bagpipes, and soundscapes. These three areas of investigation are first discussed in their original context in Chapter 3, and they subsequently guide the creative investigation discussed in Chapter 5.

2.2 Auto-ethnography

As a member of the community of musicians I studied, participant listening and participant observation were also supported by auto-ethnographic methods. Being born in a small town in Central Calabria, I have been trained as a folk musician and learned to play *conflentana* bagpipe (*zampogna)* and diatonic accordion (*organetto)* according to the traditional method based on imitation. Professional musicianship is an uncommon practice in Central Calabria: aside from rare exceptions,[1] musicians did not, and mostly still do not, play for a fee or in front of an audience of listeners. Instead, music has a social and participatory function which is still strong in the area. In the past, there was no formal musical training and no vertical teacher–apprentice relationship. As emerged from the interviews, the trainee would follow some (or even one) musicians of reference and would learn to play by imitation. The training happened "in the field" and somewhat resembles the traditional method of Bulgarian *horo* players described by Buchanan and Folse (2006, 59). The piper Vittorio Mendicino described this method with clear words during a recording session: he said that people would learn to play the same way they learned to smoke, just doing what somebody else was doing.

The way I learned to play *zampogna* and *organetto* seems to match the accounts that emerged during interviews and conversations with folk musicians in the area. I befriended and hung out with older bagpipers and accordion players, imitated their playing, and occasionally received advice or "corrections" to my playing. The constant personal relationships established and maintained with the tradition bearers allowed us to engage in conversations over the most diverse topics related to music. These often-unrecorded conversations were crucial for my training as a folk musician and later became a pivotal method of enquiry for my research. Over time, it allowed me to collect enough information to deduce aspects of the non-systematised Calabrian music theory.

Being *with* and *around* folk musicians as well as being a folk musician myself significantly contributed to this research. In fact, this experience and my participation in the musical and social life of the region parallel my research. By drawing on auto-

[1] *A chiave* bagpipers and *pipita* players are historically the only known professional musicians in Central Calabria. Travelling from celebration to celebration, they were called by the communities to accompany the statue during processions and perform in other laic and religious celebrations.

ethnographical methods (Ellis, Adams, and Bochner 2011), they provide a significant contribution to the understanding of the music that is the object of this study. Because of my being inside what I am studying (Bochner and Ellis 1992, 165), my “biographical experience” (170), the advice and “teachings” received, and the often-unrecorded conversations undertaken with folk musicians support the data that emerges through music analysis and ethnographic methods. Auto-ethnography, although not a source of primary data, is called on in support of both the analysis of relevant cultural artefacts (Boylorn 2006) and the information collected through interviewing cultural members (Foster 2014).

2.3 Decoding and analysing sound

Analyses of the Calabrian musical and sonic phenomena required different methods of enquiry, specially tailored for the kind of materials at hand. To understand thoroughly a musical culture, the researcher must study the way sound is produced, perceived, structured and used in that culture. Sound, and consequently music, is a “total social fact” (Feld 1984, 383). As such it is often studied as a form of communication of social identity (Lomax 1976). Sound shapes the world, and it is a powerful vehicle for symbolic representation. *Acoustemlogy* (Feld 2015) studies sound as a way of knowing. In this perspective, sound and soundscapes are bearers of cultural and natural meaning. *Acoustemological* enquiry focuses on “what is knowable, and how it becomes known, through sounding and listening” (12). By joining epistemology with acoustics, *acoustemology* investigates sound and listening as a knowing-in-action, a form of knowing with and through the audible. Steven Feld maintains that:

> Knowing through relations insists that one does not simply “acquire” knowledge but, rather, that one knows through an ongoing cumulative and interactive process of participation and reflection. (Feld 2015, 13–14)

Acoustemology favours enquiry in situated listening in a close relationship with space and time. It is grounded in the assumption that life is shared in relation with others, with numerous sources that are “variously human, nonhuman, living, non-living, organic, or technological” (Feld 2015, 15). Sound domesticates space and marks the passing of time, thus allowing the recognition and definition of a familiar space (Ricci 2016). I maintain that musical studies must take into account these

powerful features of sound. Sound and the perception of it must be understood within the context of communication and the acoustic habitat in which they are produced (Blacking 1974; Merriam 1964).

Antonello Ricci studies the sound of the Calabrian town Mesoraca in a book whose title is emblematic of the importance that sound holds in shaping space and time in the village. In *Il paese dei suoni* – the village of sounds – he describes how sound initiates symbolic representations that shape the landscape and the cultural understanding of it; sound marks the change of the seasons and the rhythm of the community's life through the year (Ricci 2012). This characteristic is common to oral cultures, which privilege an aural perception of reality over sight (Feld 2015; Schafer 1994; Gurevich 1985; Caporaletti 2005; Ong 1982). Although undergoing profound transformations, Calabria maintains a vital oral culture: this is especially true for the older generations who grew up before the massive spread of radio, television and scholarly education. Thus, the characteristics of sound that emerged in Ricci's research are still commonly found throughout the whole region, especially in rural communities still devoted to farming and pastoralism.

In this research I studied sound and music from the epistemological standpoint described in these pages. As I will show in Sections 3.4 and 3.5, this method of enquiry guided the analyses of the sound of bagpipes and their tuning process, and the study of bells as communication devices for herd animals.

The analyses of sound and soundscapes required different software and methods. Spectral and pitch analyses of Calabrian sonic phenomena – such as the sound analysis of bagpipes and their tuning process, or the analyses of Calabrian soundscapes and the use of bells in herd animals – where conducted with the freeware software *Sonic Visualiser* (Cannam, Landone, and Sandler 2010). The analysis of the tuning system of bagpipes posed problems related to the polyphonic nature of the instrument. As I will describe later in this thesis, Calabrian bagpipes produce a scale that is encapsulated within two drones: the instrument produces a continuous, uninterrupted sound whose range spans over only one octave. Furthermore, the sound propagates from a single source as the four pipes are all encapsulated in a wooden block which is organologically classified as the *stock* (Baines 1995). All these features pose significant issues when conducting pitch analysis. The arrangement of the instrument does not allow to single out specific pipes, unless by forcefully muting the pipes with the consequence of creating a pressure imbalance within the instrument. This procedure would produce pitch

fluctuations which could, in turn, compromise the analysis. Consequently, I kept unaltered the polyphonic nature of the instrument, a procedure that leaves some margin for pitch deviation which had to be cross-checked with a different analytical technique. Therefore, I cross-checked the software-based analyses of the bagpipes with an aural evaluation of the pitch with the help of a *Max MSP* patch developed by the Canadian composer Marc Sabat. *The 31-Limit Helmholtz–Ellis Calculator* (Sabat, n.d.) is an "accidentals and ratios to cents additive synth for microtonal MIDI playback" which I used as an aural reference to refine the pitch analyses conducted through *Sonic Visualiser*.

2.4 Music analysis

The study of Calabrian music was mainly concerned with issues related to its vocabulary and its generative grammar. Especially concerning the latter, the analyses focused on the variation principles of instrumental music, primarily on melodic and rhythmic variation. I performed comparative, corpus-based and repertoire-based transcriptions aiming at decoding the generative principles of dance music and at understanding how pieces are perceived and shared within the musical community. I transcribed various versions of the same tune and compared different performances both by the same and by different musicians.

A problem arose concerning the choice of the format to be adopted for the transcription of the musical materials studied (e.g. Nettl 1983, 74–91). Focusing these analyses exclusively on melodic and rhythmic variation, I chose to use the traditional music notation system on staves. However, this device is limited when it comes to notating music with such fluid characteristics as the one at issue here. For instance, the internal division of the beat is not univocal. In fact, it is common that in the same *sunata,* binary and ternary divisions coexist or are even interchangeable: sometimes a figure can be interpreted somewhere in between binary and ternary division. Italian Ethnomusicologist Vincenzo La Vena maintains that binary and ternary divisions of the beat are contrasting typologies in written music, but much less in oral traditions where the proportions among the sounds within a beat are not rigorous (La Vena 2005, 132). Besides, every musician has a personal and peculiar way to articulate the pulse. These differences characterise the style of each musician and can be compared to the jazz musicians' personal way of interpreting

swing. A transcription of all these subtle details would jeopardise the readability of the score. I resolved to prioritise immediate readability and opted for the traditional notation system, especially in consideration of my focus on rhythmic and melodic variation. However, these transcriptions are to be taken as approximations of a system forced on music not meant to be written.

I conducted the analyses from the perspective of the emic, non-systematically verbalised Calabrian theory of music that emerged through ethnographic interviews and participant observation. Folk musicians acknowledge a modular and combinatory process that governs dance music. These features influenced the choice of the music-analytical methods adopted in this text. As I will discuss in Section 3.3.3, folk musicians use a modular approach that adopts musical entities called *girate.* They are building blocks of musical performance that are strung together to form more extended melodic constructions. They served as the analytical tool for the music discussed throughout the thesis. I also translated *girate* in prescriptive principles for generating music in the creative research discussed in Chapter 5.

Comparative analyses were performed by transcribing the tunes to the same key in order to more readily recognise similarities and differences among the various performances. I also turned to various software which helped with overcoming specific issues posed by the recordings. To slow down the recordings I used the software *Transcribe!*. However, the files posed some problems related to the polyphonic set of the instruments analysed – mainly bagpipes and diatonic accordion. These instruments produce a polyphony that is compressed in a very narrow ambit and therefore poses issues in recognising the actual notes played by the left and right hands. The filtering tools in *Transcribe!* are designed mainly to single out monodic melodies, such as in a jazz solo. For a more precise transcription of the melodies produced by the complex polyphonic instruments of Calabrian music, I utilised the filters, equalisers and analysis tools provided with software like *Apple Logic X* and *Sonic Visualiser* (Cannam, Landone, and Sandler 2010). The transcriptions were cross-checked with observations of the fingerings adopted by the musicians – both in the course of performance and by employing video recordings – and data collected through ethnographic methods.

2.5 Variation, improvisation, extemporisation

Variation is a characteristic common to a large body of folk music, and it has been acknowledged and discussed since the early days of ethnomusicology (e.g. Bartók and Suchoff 1992; Brailoiu 1978; Blacking 1974). It appears to be one of the most recurring features in folk music, and Calabrian music is no exception. During my research, I focused on variation as a principal matter for investigation. Often musicologists attribute folk music variation to the category of improvisation. However, improvisation is a very problematic term when applied to non-Western music. As Bruno Nettl points out:

> The concept of improvisation is not unitary but includes many vastly different kinds of un-notated music-making, which casts some doubt on the efficacy of the term itself (Nettl 2013).

The Western tradition of music scholarship sometimes assumed that all non-notated music is in some way improvised (Nettl 1991, 3). Furthermore, throughout the centuries, improvisation has assumed a pejorative meaning: with such a negative connotation, it has usually been opposed to the better-valued practice of composition. Improvisation is associated with characteristics of non-preparation and expediency, and opposed to thoughtful, methodologically rigorous and more artistically valued composition. In doing so, those scholars perpetrated a colonialist agenda that supported the vision of a developed Western civilisation as opposed to the underdeveloped foreign countries (Nooshin 2003). Bruno Nettl (2013) proposes a view of composition and improvisation as parts of a continuum. This perspective significantly contributes to the understanding of real-time processes in non-Western music as it attempts to solve the opposition between these practices and relieve improvisation of the negative connotations historically attributed to it (Nettl 1983). Furthermore, Nettl's view of composition and improvisation sitting at the ends of a spectrum points out that musical performance always involves both some pre-established plan and some degree of interpretive choice. By shifting the focus to performance, Nett's spectrum attempts to overcome a use of 'improvisation' that "served ideological purposes" (Nooshin 2003) and relegated all non-Western musics to an indistinct category of otherness. Nevertheless, this approach seems not to prove completely adequate for comparative analysis (Fossum 2017) and needs scholars who adopt 'improvisation' to attentively problematise their choice. Many scholars have questioned the appropriateness of describing all non-written music

traditions through improvisation (Sutton 1998). For instance, Leo Treitler, when referring to the processes of variation in Mediaeval music, expresses doubts about the adequacy of the term 'improvisation' although he then resolves for adopting it.[2] Laudan Nooshin (2003) has offered a political critique on the use of improvisation which often served an orientalising discourse of division between Western art music from non-Western traditions. Often, scholars choose to avoid applying concepts that are external to the culture they are observing. They investigate the way musicians verbalise their music to privilege the emic point of view. David Fossum (2017) provides a useful insight of the problematic discourse around improvisation in ethnomusicology. He wisely observes that:

> Given the imprecision of the term 'improvisation,' when culture bearers or musicologists use the term – or deny its applicability – the most helpful question may not be whether the term is appropriate or not, but rather what motivates the desire to use it (or deny it) at all" (Fossum 2017, 5).

In Calabrian music, variation seems to function on a balance of fixed and mobile elements. When looking at dance repertoire, for instance, the first noticeable feature is the variability of the musical outcomes. This music seems to eschew formal rigidity and appears to be, instead, somewhat changeable and fluid. The tunes, although shared across members of a community, appear to be different from performer to performer. Yet, they are recognised and appreciated by the listeners as merely being different performances of the very same tune.[3] Such variability can be found at many levels, from the way the basic music materials are arranged in musical phrases, to the way the piece itself is organised in sequences of musical phrases. This variability thrives on processes of real-time manipulation of the musical materials. However, musicians from Central Calabria seem to conceptualise neither composition nor improvisation. Theirs is mostly a *player's art* (Williams 1973); in this music, the trinity performer-composer-improviser collapses into a single person whose role is not defined by the three categories above. In Central Calabria, the process of producing, interpreting and transforming music in real time

[2] Treitler points out how improvisation was extraneous to the theory and practice of Medieval music. In fact, it appeared with the Modern era to distinguish non-written practice from the newly established written one (Treitler 2007).

[3] In my research, I recorded a corpus of *sunate* associated with specific names. These names are unequivocally identifiers for the tunes rather than referring to a broader category, such as a style. When talking about the *sunate*, musicians use the definite article «la fina», «la quattrubassi», «la zopparella» or «chiđđa ca sonenu ari Cu$\chi\chi$ienti» ("the one they play in Conflenti»). Instead, when referring to styles, which most commonly happens in vocal music, the expression used is "a la", so that one sings «all'arietta» or «alla petrejancara».

is intrinsic to the act of performing and resides in the very way music is built. Nevertheless, in attempting an analysis of Calabrian real-time phenomena of variation that takes into account the emic theoretical framework in which music is produced, the two categories of composition and improvisation prove inadequate, or at least not wholly explicative.

In my analyses, I avoid those terms: this choice is not intended to draw lines, exclude or divide (Nooshin 2003); it is rather an attempt to find a framework that better suits the way music appears to be conceptualised and verbalised in the region. In Central-Calabrian dance music, the performers rely on strategies for producing music *extempore* in relationship to well-defined and shared models. The realisation of a well-structured model seems to recall what Martin Williams (1973) suggests when referring to those real-time processes in a jazz performance which are not commonly ascribed to the realm of improvisation (for example realising walking-bass or piano voicings) and that he labels as *extemporisation*. Building on this concept, Vincenzo Caporaletti analyses the phenomenon of real-time music-making as the realisation of a well-defined and stable model, both in the aforementioned jazz practices and in other oral traditions where the concepts of composition and improvisation are not present. He defines *extemporisation* as a real-time "creative strategy" (Caporaletti 2005, 110) that is embodied in the performance practice. It is enabled by the player in relation to a culturally defined virtual model, and responds to a highly structured normative code. It is not simply an expressive variant of the text, as interpretation is for Western music of the last three centuries, but it "exerts a constructive function on the text itself" (111). Extemporisation is proper to oral culture where music is not conceptually and perceptually bound to the visual medium of the score, as in Western composition. It is grounded in what Caporaletti calls the *audio-tactile principle*, a process that validates the supremacy of embodied cognition in the generation and perception of music. Caporaletti ascribes extemporisation to the category of improvisational processes, although he then distinguishes it from "proper improvisation", to which he attributes a wider degree of textual creation. However, one can argue that extemporisation is a subset of improvisation: a type of real-time transformation that deals with a strictly defined model through likewise strictly defined rules. In this work, I use the term extemporisation as a type of improvisation; this form of real-time agency seems to describe well the emic view of musical variation. From my ethnographic research, it emerged that musicians refer to a well-defined model and

conceptualise their playing in a way that recalls Caporaletti's notion of *extemporisation.* These data, discussed in Section 3.3, guided my analyses of Calabrian music variation and subsequently served the creation of a similar process in my improvisation practice.

2.6 Data collection

During the doctoral years, I conducted 6 field trips for a total of 18 weeks of field research. The research involved 20 direct participants in 8 communities: 18 musicians, 1 shepherd, 1 bell-maker. To those who were directly involved, there must be added a large number of informants who considerably, although accidentally, contributed to the research by providing valuable information on repertoire and techniques in the course of everyday conversations.

I conducted research, observed and participated in both public and private events in which music plays a crucial role, such as religious fests or private banquets. This procedure of data collection allowed me to witness music in its social context and observe social and musical interaction among the participants. As the public occasions in which music traditionally takes place have narrowed in the past decades, the chances to observe such events have lessened. To increase the chances for research and facilitate observation, with the help of the association *Felici & Conflenti* of which I have been appointed Research Coordinator, I organised social events that functioned as the social context in which music would traditionally take place. The focus was on creating the circumstances in which musicians would naturally get involved rather than on re-enacting the music or the social context in a perspective of performance ethnography (Alexander 2005). Thus, *Felici & Conflenti* and I organised fests, banquets and country festivals and invited musicians and dancers to participate freely.

Besides the aforementioned research method, I organised private meetings and recording sessions with musicians and informants. These private sessions allowed me to collect detailed information about playing techniques, conduct more focused observations and take "cleaner" and less noisy recordings. Most importantly, this format allowed interviewing the participants.

In December 2015, I participated in the Christmas celebrations in Conflenti where I recorded instrumental music for bagpipes and *organetto*, and songs

accompanied by either *organetto* or bagpipes. A few days later, with the help of friends and researchers in Calabria, I organised an informal recording session in the basement of the church in Nocera Terinese. The session took the form of a banquet to which I invited ten bagpipers, *organetists* and dancers. This research setting allowed recreating the traditional social context for musical performance yet reducing the difficulties and "distractions" often encountered in big festivals or overcrowded celebrations. In the same period, the Chiodos family invited me to the family house in Borboruso to celebrate the slaughtering of a pig, giving me the chance to acquire audio and video documentation. This festive occasion is often celebrated with music and dance, and the Chiodos are one most musically active families in the area.

In April 2016, I organised a second recording session with musicians and dancers in Nocera Terinese. As with the previous one, I organised a banquet and invited ten musicians. In the same period, I held a smaller gathering with only four musicians and recorded music for bagpipes and accompanied singing. Drawing together many musicians helps to initiate debates, which often touch upon topics – such as the non-verbalised theory of music – that are less likely to be discussed in one-to-one meetings. I also visited six musicians and conducted short interviews concerned mostly with singing styles and relative accompaniment. Unfortunately, on this occasion, I was not able to record their playing.

In July–August 2016, I conducted several recordings on various occasions. As co-organiser of *Felici & Conflenti*, a week-long residential event of seminars and workshops on music from central Calabria, I performed extensive observations and recordings during the event. *Felici & Conflenti* is a space for enthusiasts to meet folk musicians so as to celebrate and make music together; this format proved very productive concerning data collection. In the same period, in collaboration with *Felici & Conflenti* and the city halls of Nocera Terinese and Pedivigliano, I co-organised public gatherings in Nocera Terinese Centro, Nocera Marina, Maletta, Pedivigliano and Castagna. These occasions, besides being invaluable for data collection, were also essential to observe the musical phenomena in public contexts and open up new contacts for future observation.

In December 2016, I recorded bagpipes during the Christmas celebrations. In the same weeks, I also researched animal bells. I met with a former shepherd who owns over a hundred bells and interviewed Rocco Greco, blacksmith and bell-maker from Figline Vigliaturo.

In July–August 2017, I conducted new observations during *Felici & Conflenti*. During the same summer, I organised a public gathering in Nocera Terinese in collaboration with the city hall. These highly attended events allowed me to observe mainly dance music and songs, and also allowed me to initiate new contacts for research.

In December 2017, I conducted new observations during the first winter edition of *Felici & Conflenti*. I also organised a public debate and a new interview with the bell-maker Rocco Greco and collected new data on the use of pastoral sounds.

During the research, I recorded data through the combined use of a diary, field notes and audio-video recordings. In the research environment described above, it is often challenging to capture recordings for the whole time spent with the subjects. Such a recording would span over an entire day and would catch hundreds of minutes of information unrelated to research. In these occasions, a diary for field notes and a mobile phone become precious resources. Recordings were taken using mainly a Zoom H2 digital recorder. When something unexpected happened, I used my mobile devices to record both sound and video. The recorded data consist of about 20 hours of audio and 4 hours of video.

Also essential for the study of folk music were my visits to archives that contain both historical recordings of Calabrian folk music and bibliographical resources on the topic. In December 2015, I visited the *Centro Interdipartimentale di Documentazione Demoantropologica Lombardi-Satriani* at the Università della Calabria, and the *Biblioteca della Calabria* in Soriano Calabro. I accessed their collection of ethnological and ethnomusicological publications on Calabria and their unique archives of folk music recordings. In June 2016, I visited the *Archivio Etnico Linguistico-Musicale AELM* and the *Bibliomediateca* at Accademia di Santa Cecilia in Rome, which host extensive collections of historical field recordings of Calabrian music.

2.7 Summary

In this chapter, I discussed the methodological framework in which I collected and analysed data on Calabrian music. The study of folk music was conducted through qualitative research within the disciplinary context of ethnomusicology, and by drawing on related disciplines such as auto-ethnography and acoustemology.

The methods adopted consisted of participant observation, participant listening, ethnographic interviews, sound and video recordings, and bibliographical and archival research. The data collected through interviews and participant observation were decoded through thematic analysis. They were concerned with three main areas of enquiry within Calabrian folk music: generative principles, tuning systems and process of bagpipes, and soundscapes. Research in these areas required the adoption of multiple analytical methods. Spectral and pitch analyses, as well as comparative transcriptions, were cross-checked with the information that emerged through ethnographic research in order to interpret the phenomena at hand in accordance with the emic point of view. The variation processes of Calabrian music were studied within the conceptual framework of Vincenzo Caporaletti's (2005) *extemporisation*.

The next chapter presents the outcomes of the ethnomusicological research I conducted in Calabria. It offers detailed descriptions and analyses of the data that emerged in the three areas of enquiry mentioned above. The data discussed in the next chapter subsequently became the foundation of the creative enquiry which I will discuss in Chapter 5.

Chapter 3
Calabrian music

This chapter discusses the data that emerged from my ethnomusicological research in Calabria. It contains detailed analyses of Calabrian musical and sonic phenomena, and discusses them in their original contexts. The chapter begins by briefly introducing the region; it also offers a review of the ethnomusicological literature currently available on Calabrian music and which supported my enquiry.

The second section discusses the core features and the generative principles of Calabrian music. I first discuss what I define as *economy of means*, that is, the very limited musical resources with which musicians construct the musical discourse. *Economy of means* emerges in the organology of the instruments, which often produce sounds within a narrow note-range. However, this feature is also observable in music performed on instruments that offer access to a broader ambit. In fact, as I will discuss further, the music tends to be confined within a specific range and revolve around a handful of musical cells that are recombined together and transformed. I discuss the processes of *micro-variation*, a way of generating dance music from Central Calabria that relies on modularity, iteration and variation. Through corpus-based, comparative analyses I discuss how music is produced, performed and perceived by folk musicians, and analyse problems related to the perception of the identity of the tunes.

The third part discusses the tuning process of bagpipes. After briefly introducing the types of bagpipes found in Calabria, I discuss the acoustic properties of the single reed. This sound-production device allows the player to act on the acoustic properties of every single pipe and modify their pitch. This characteristic of the single reed, while allowing the piper to achieve the desired pitch and tone character, makes the tuning of the instrument unstable. Consequently, the bagpipe requires a long and attentive tuning process, which is achieved through different procedures that are differentiated by geographic area. Because of the highly-refined skills involved and the different procedures adopted, the tuning process is analysed here as a musical repertoire that the piper must learn to master as much as other pieces for bagpipes.

The last section analyses the sound environment of Calabria. By drawing on acoustemological methods, I describe the way sound is perceived, appreciated and used in Calabria. In this section, I draw attention to the use of bells for herd animals. I describe how different species of animals are associated to different ways of using bells in accordance with their social and individual behaviours. I will then describe how bells shape the landscape, how they bear meaning for humans and how they initiate communication among the animals themselves.

The data discussed in this chapter are presented in a purely ethnomusicological perspective. However, the phenomena discussed here have become the foundation of my creative enquiry into contemporary music. I will discuss their specific connection with my composition practice and how they inform my music in Chapter 5, where I analyse the creative process in detail.

3.1 State of research in Calabria

Calabria, placed between Basilicata and Sicilia, is one of the southernmost regions of Italy, see Figure 3.1. It is also one of the richest in traditional music instruments (Scaldaferri 1994), and is home to a vast array of folk music that is differentiated according to geographic areas, each characterised by specific instruments and repertoires.

Figure 3.1 Position of Calabria on the map

Research in Calabria has brought to light a vast heritage of folk music, and investigations are still being conducted for further developments. This section gives an overview, although not exhaustive, of the current state of research in the region and reviews some of the most relevant publications available to date.

Although there are some pre-existing records (for instance Fedeli 1912), Calabrian music has been the object of systematic ethnomusicological study from the 1950s. During that decade, Alan Lomax and Diego Carpitella, as well as Walter Hennig, conducted the first field recordings in the region. Henning published a collection of folk songs and instrumental music from the southern regions of Italy, which includes four tracks recorded in Calabria (Hennig 1956). Alan Lomax and Diego Carpitella conducted extensive research in Southern Italy (Lomax and Carpitella 1957), on the music of Arbereshe communities in Calabria (Ricci and Tucci 2007) and on the music of the entire region (Lomax 1999).

Since the 1970s, there has been growing attention on the region, and publications have been more consistent. In 1976, the Galpin Society Journal published an article about an instrument that would be soon classified as the *surdulina* bagpipe (Jensen and Andersen 1976). The “unusual bagpipe” described in Jensen and Andersen’s article indeed presents features which make it peculiar among Italian bagpipes: the left chanter is closed at the distal end so that the sound can be interrupted when closing all of its four finger-holes. A brief description of the *surdulina* also appears in Anthony Baines’s book on bagpipes, together with a description of the *zampogna a chiave* (Baines 1995). From the end of the 1970s, organological research in the region intensifies. Roberto Leydi and Febo Guizzi published a series of works on Italian and European bagpipes that include information about the various types found in Calabria (Leydi 1979; Leydi and Guizzi 1986; 1995; 2002; Guizzi and Leydi 1980; 1985; Guizzi 2002).

Bagpipes are indeed among the most studied instruments of the region because of the richness of families and types, and their organological peculiarities. Vincenzo La Vena extensively researched bagpipes in Northern and Central Calabria. A first outcome was published as a preprint that stemmed from his thesis in ethnomusicology (La Vena 1986). His research continued in the following 30 years and culminated with the release of the extraordinarily detailed trilogy on the *surduline* (La Vena 2002; 2003; 2005). His research also included studies on propaedeutic instruments for the bagpipe and other instruments related to this aerophone, such as double cane clarinets and double flutes (La Vena 1994; 2009).

La Vena also published comprehensive works on toy instruments and sounding objects in Terranova da Sibari (La Vena 1996; 2001). In 1979, Roberta Tucci published the outcomes of her research on bagpipes and the double cane flute in Calabria, which has been reprinted recently (Tucci 2009), and which also included analyses by Carlo Crivelli. Bernard Lortat-Jacob (1989) proposed a new interpretation of the music contained in Tucci's book in which he highlighted a modular process that governs bagpipe music in Calabria. Scaldaferri (1994) publishes an analysis of the melodic/harmonic features of Calabrian bagpipes. Chiara Cravero (2006) published a monograph on bagpipes from the southern part of the region, mostly *a paro*, *a chiave* and *a moderna* bagpipes.

Other instruments have attracted the attention of researchers in Calabria. One of the most peculiar is the *lira,* a bowed chordophone linked to the *Byzantine lyra*, that is found in the Grecanic areas in the southern part of the region, and on Mount Poro (Plastino 1994). Research on this instrument by the members of the musical band *Re Niliu* was timely as they reached the last living makers and players of the *lira*. Their research contributed to the survival and fostering of the instrument so that, in recent times, it is undergoing renewed interest. The *chitarra battente* is present in the region in two main variants, and its music has been the subject of various monographic works (Tucci and Ricci 1985; Ricci and Tucci 1994; Santagati 2001; 2010). Researchers have also focused on "minor" or ephemeral instruments – see for instance Plastino's (1988) article on the *zumbettana*, the overtone flute made from the fresh bark of chestnut trees. Most of the instruments mentioned here were described in one of the few international papers about the music of the region. Published by the Galpin Society Journal, this article, although outdated and imprecise, provides an overview of the rich assortment of musical instruments in Calabria (Ricci and Tucci 1988).

Researchers have also focused on musical repertoires both from specific areas, towns or musicians, as well as from the whole region. Sound anthropologist Antonello Ricci has researched sound and music in the village of Mesoraca. His research focused on the social and symbolic value attributed to sound and music, which permeate every aspect of the community's life (Ricci 1995; 1996; 2012). In two monographs, Antonello Ricci focuses on the repertoire of specific musicians (Ricci 2006b; 2006a). Antonio Bevacqua (2006) researched the festive and processional repertoire for military-drum ensembles – often accompanied by *a chiave* bagpipe and *ciaramella* – in Sila, the mountain plateau in the centre of the

region. Giorgio Adamo (2006) wrote about the role of music and dance in the celebrations in honour of the Madonna di Polsi, in Southern Calabria. Goffredo Plastino (1995) studied the liturgical repertoire of religious confraternities in San Andrea Jonio. La Vena studied the chants of Saint John Chrysostom's liturgy in the Arbereshe village of San Cosmo Albanese (La Vena 2007). Liturgical Arbereshe chants in Lungro are the object of a study by Nicola Scaldaferri (2017).

Along with the monographs mentioned above, there have been a wide range of publications concerning music from broader portions of the Calabrian territory if not from the whole region. Folklorist Leonardo Alario has published abundantly about secular and religious Calabrian vocal repertoires (Alario 2009; 2014). In the period 1928–1940, the ethnologist Raffaele Lombardi Satriani published a six-volume book containing a colossal collection of Calabrian songs which embraced the whole region (Satriani 1928; 1931; 1932; 1933; 1934; 1940). The publication contains only transcriptions of the lyrics, without focusing on the music. More than 50 years later, Antonello Ricci and Roberta Tucci researched and recorded some songs whose lyrics had been previously published in Satriani's collection (Ricci and Tucci 1997). The two ethnomusicologists also published a collection of vocal and instrumental music from the whole region in a sort of anthology of Calabrian music (Ricci and Tucci 2004). Danilo Gatto, a former member of the band *Re Niliu*, which played a fundamental role in the research and preservation of folk music in the region, has published a similar collection. His book is intended as an anthology of folk music for primary schools in Calabria (Gatto 2007).

My research interest in Calabrian music dates back to my master's dissertation in ethnomusicology, when I researched dance music from the Central-Tyrrhenian part of the region, across the provinces of Catanzaro and Cosenza.

At that time, I focused on a small portion of the region, attracted by the great Marian Pilgrimage in Conflenti.[4] I approached the pilgrimage and the celebrations for the Madonna di Visora in Conflenti – in central Calabria – as a primary factor for the development of a shared repertoire in the surrounding communities. I researched dance music for accordion and bagpipes of that area and recently published the outcomes in a monograph (Ferlaino 2017) that also contains part of the research conducted during the doctorate. Information concerning the dance of the region, emerging in that research, is also published in a book chapter that gives

[4] Except for the monograph by Vincenzo La Vena (2005), which at the time was in the course of completion, research in that area lacked systematic studies.

an account of the choreutic styles of the area (Ferlaino 2018). Part of the research conducted during the doctorate is also published in a collaborative CD with booklet that includes vocal and instrumental repertoires of the surroundings of Mount Reventino and the valley of the River Savuto (Bressi et al. 2017). The analyses of the Calabrian generative principles contained in this thesis are the object of an article entitled *Generative Principles of dance Music in Central Calabria*. This article has been submitted to Analytical Approach to World Music Journal and is currently being revised for publication.

3.2 Economy of means

A consistent part of Calabrian music is characterised by the sobriety of resources adopted for generating it. Music is often played on instruments that produce very narrow ambitus, and revolves around short melodic/rhythmic fragments that are the basis of the musical discourse. I call this characteristic *economy of means*, and it is observable both in the organology of the instruments and the musical material adopted during a performance.

Organological studies show that Calabrian instruments often produce a narrow note-range – rarely exceeding an interval of a sixth – and a limited number of pitches. Such a restrained availability of pitches can be observed in many traditional instruments, a few examples of which are shown in Figure 3.2–Figure 3.6.

Figure 3.2 shows the note-range of the *surdulina* bagpipes.[5] The instrument consists of two melodic chanters whose ambit is encapsulated in an octave played by the drones. Each chanter produces a very narrow scale: the right-hand chanter produces a 5th whereas the left-hand chanter a 4th. The combination of the two chanters results in an ambit of a 7th, in some repertoires confined to a 6th. The performing technique requires the production of two individual melodies that are interwoven through counterpoint.

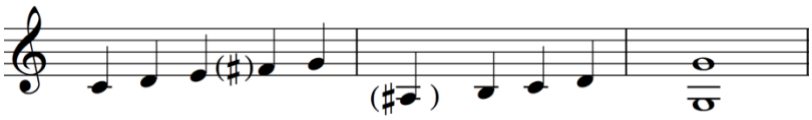


Figure 3.2 Note-range of the *surdulina* bagpipes

[5] See Chapter 0 for a detailed description of this instrument.

The two chanters of the *zampogna a chiave*, a somewhat modern instrument compared to the *surdulina*, both produce a range of a 5th, an octave apart – Figure 3.3. As for the *surdulina*, the music results from the interlocking of two melodies played on each chanter.

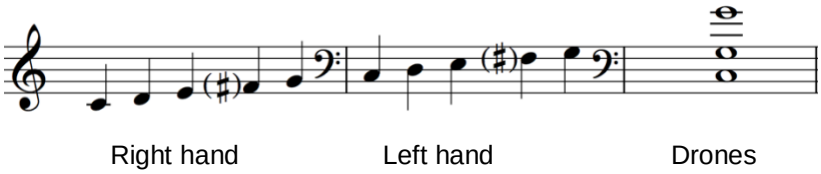


Figure 3.3 Note-range of the *zampogna a chiave*

The double flute *a chiave* is an instrument found in the southern part of the region. It is made of two flutes played together by a single player. Its range spans over an interval of a 6th, with six pitches produced by the right-hand pipe and four by the left hand (La Vena 1994) – Figure 3.4.

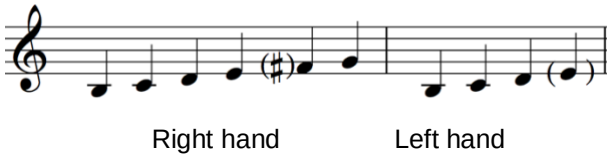


Figure 3.4 Note-range of the double flute *a chiave*

The single cane flute is found across the whole region, and it is one of the most common ephemeral instruments in Calabria. It is found in a variety of types, differing mainly in the number of finger-holes available on the instrument. The most common models – with four frontal finger-holes, and with four frontal and a thumb hole – produce a range of a 5th or a 6th – Figure 3.5

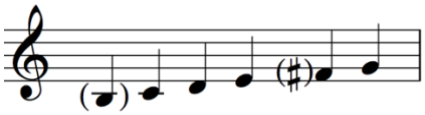


Figure 3.5 Note-range of the cane flute

The *lira Calabrese*, an instrument that belongs to the family of Byzantine lyra (Plastino 1994), is a three-string bowed instrument – see Figure 3.6. Of the three, only the D string is fingered up to G. The second string is played continuously as a drone, whereas the third works as a tonic for the melodic construction. Consequently, the melodic constructions performed on a *lira* are confined within the range of a 5th.

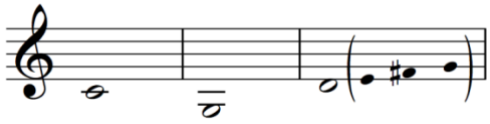


Figure 3.6 Note-range of the *lira Calabrese*

This last example shows that even when the music is produced on instruments that give access to a higher number of pitches, such as the lira, the melodic constructions are often confined within a restricted range. A rather clear example of this characteristic is given by the dance tune called *fina*, one of the main tunes of the dance repertoire for accordion in Central-Tyrrhenian Calabria. Here, I briefly touch upon this tune only in relation to the concept of economy of means and defer a detailed analysis of the piece to Section 0. Despite the extensive availability of pitches accessible on an eight-bass diatonic accordion, the core element of this tune is confined to the use of three (occasionally extended to four) buttons of the right-hand keyboard (see Figure 3.9 in Section 3.3.2). The parsimony of notes adopted is also reflected in the other name of this tune: this piece is in fact called also *tribucette* after the performative feature that requires the use of only (or mainly) three buttons.

Economy of means is strictly connected to the generative grammar that governs dance music from the region. In the next section, I will discuss how this parsimony of musical materials gives birth to pieces of music that pivot on small core elements. Musicians from the area vary, iterate and recombine these core elements in a modular process[6].

3.3 Generative principles of dance music in Central Calabria

Southern Italy has a rich and vivid tradition of folk music that shows a wide variety of practices and repertoires. Studies of dance music from different Italian regions have identified commonalities as well as peculiarities that define the specific characters of each repertoire: although governed by similar generative principles, music from different areas is characterised by different ways of generating and organising the musical materials in the performance. In this section, I offer an insight

[6] For more on recombination in improvisation, see Berliner 1994; for a discussion of improvisation adn iteration, see Landgraf 2011.

into the generative principles of dance music for eight-bass diatonic accordion from Central-Tyrrhenian Calabria.

Research into generative principles has grown considerably during the past decades. Reflecting the important impact of Parry-Lord oral-formulaic theory (Lord 1960), many ethnomusicological publications have focused on formulae, schemas and formulaic principles in relationship to real-time musical processes. For example, Johansson (2017) describes how thematic improvisation in Irish traditional fiddle music recurs to a well-defined set of resources for melodic and rhythmic variation. Racanelli (2012) identifies recurring formulae and formulaic principles in Mandé griot guitar improvisations. Studies of Gamelan have focused on the use of melodic formulae (Becker 1980). North-Indian music has also often been studied with a focus on schemas, seed ideas, and improvisation (Zadeh 2012; McNeil 2017).

Italian and South-Italian folk music has also been an object of research to understand its generative principles, although these studies are accessible only to an Italian readership. This research has focused on formulae, modules, seed ideas, and on the interrelation of these techniques with improvisational and real-time processes. For instance, Tullia Magrini (1988) describes the use of melodic formulae along with a fluid modality and melodic variability in Adriatic singing. Giorgio Adamo (1993) identified a common melodic nucleus in diverse vocal repertoires from Basilicata.

Studies on dance repertoires from Central and Southern Italy have identified generative processes based on the perpetual iteration and variation of stereotyped melodic fragments. Researchers describe this music as being constructed through a set of separate parts – often classified as *modules* – that are combined to form a complete whole. Modularity is a real-time process that is observed at many analytical levels, from the recombination of different melodies to the recombination of the melodies' internal constituents. Giovanni Giuriati (1982) identifies in the *tarantella montemaranese* in Campania a series of melodies that are repeated, varied and strung together throughout the performance. These melodies are made of smaller constituents that are also varied and recombined, similarly to glass particles in a kaleidoscope. In his study on the *saltarello di Amatrice* in Lazio, Giuriati (1985) identifies a melody that can be stretched through the iteration, variation, and recombination of some of its parts. Francesco Giannattasio and Bernard Lortat-Jacob (1982) describe music from Sardinia as the recombination and

variation of small melodic fragments. They compare these *modules* to the bricks of a Lego construction that can be recombined into different shapes.

Studies on Calabrian bagpipe music have also identified modular processes in which a melodic shape is constantly repeated and varied. Vincenzo La Vena (2002; 2003; 2005) describes the music for *surdulina* bagpipes in Northern and Central Calabria as the development of an underlying basic melodic structure through *modular iteration*. Chiara Cravero (2006) highlights the recurrence of melodic fragments and phrases in music for the *a paro* and *a moderna* bagpipes in Southern Calabria. Carlo Crivelli's (1979) analysis of Calabrian bagpipe music identified a process – that he defines as *micro-variation* – based on the continuous iteration and variation of small melodic fragments. However, Crivelli neglects ethnographic observations entirely and conducts analyses that betray a Western musicological approach that does not fit the music at hand. Bernard Lortat-Jacob (1989) proposes a different analysis of the same recordings that takes into account the indissoluble link of this music with dance.[7] He analyses bagpipe music as a concatenation of short musical fragments that are recombined through a modular principle. Although they provide a significant contribution to the study of *micro-variation* and *modularity* in Calabria, his analyses are limited to bagpipe music and focus mainly on rhythm and ornamentation, while almost neglecting elements of melodic variation. They also approach the pieces as self-standing objects without comparing multiple performances, or attempting to understand these processes in the broader context of a repertoire.

This section proposes an insight into the concepts of *modularity* and *micro-variation*. Although familiar to Italian ethnomusicologists, these processes have never come to the attention of the international scientific community. I examine a repertoire that has never been studied before and offer a contribution to the study of formulaic music and real-time musical processes, by describing a highly formalised process of melodic recombination and variation. To date, studies on modularity in Calabria have focused exclusively on bagpipe music. Here, I focus instead on the generative principles of dance music for diatonic accordion in Central-Tyrrhenian Calabria. I propose repertoire-based analyses that take into account the emic theory of music emerging from extensive ethnographic observation. Although similar to the generative principles of bagpipe music, these processes are extended into the

[7] The harmonic alternation of bagpipe music has a counterpart in the dance, which is often based on figures that change the supporting leg along with the music.

formation of more complex melodic constructions. By comparing multiple versions of the same tune, my study also brings new insights into problems related to the identity of the tunes. Whereas analyses of Italian modular music identified the melodic constructions as the defining factors of the pieces' identity, in the repertoire I am focusing on, the identity is defined by key musical elements that appear to be decidedly more important than the complete melodic constructions of which they are parts.

First, I briefly present the instrument and introduce the melodic materials of dance music as they are conceptualised by the tradition bearers. I then analyse two pieces of dance music: *fina* and *quattrubassi*. The analysis of *fina* provides an insight into modular processes that, similarly to bagpipe music, revolve around a single melodic shape. This section also describes the processes of real-time manipulation of the musical materials. The analysis of *quattrubassi* describes modularity in more complex tunes, in which different orders of melodic fragments and musical elements are recombined into more extended melodic constructions. This section compares performances from different players and illustrates how the shared tunes vary considerably among the musicians of the area. The final part discusses the significance of the musical materials in defining the identity of the tunes.

3.3.1 Dance music

In these pages, I focus on the music of Central-Tyrrhenian Calabria, a small portion of Calabria placed across the border between the provinces of Cosenza and Catanzaro, and which surrounds the valley of the River Savuto, see Figure 3.7. Research in this area has identified shared musical and organological features that have led scholars to view it as a distinct area (La Vena 2005; Ferlaino 2017; Bressi et al. 2017). The Pilgrimage of the Madonna di Conflenti, along with smaller religious and laic celebrations, have played a crucial role in the shaping of a shared repertoire that is distinct from other areas of Calabria. Dance music in this area consists almost exclusively of pieces for the local bagpipe[8] and for eight-bass accordion. Dance music is one of the most consistently practised repertoires, and it has a prominent role in the social and religious life of the area (Bressi et al. 2017).

[8] Classified as *zampogna conflentana* and known in the area only as *zampogna*, this instrument belongs to the broader family of the *surduline* (La Vena 2005).

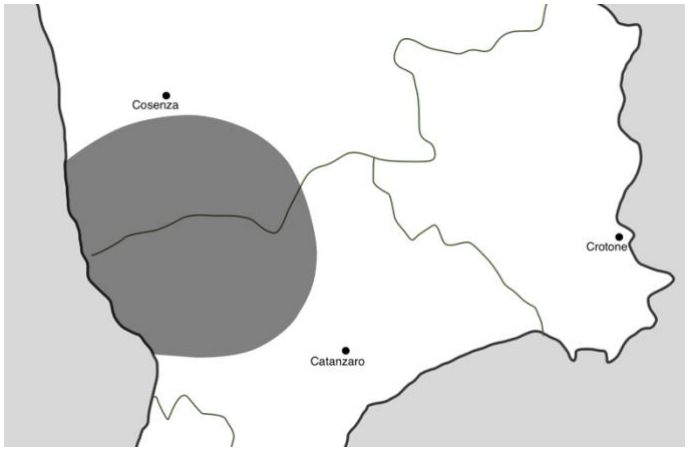


Figure 3.7 Portion of Calabria studied in the analyses of dance music

When comparing different versions of a *sunata,* a considerable degree of variability emerges from performance to performance. The tunes also appear to be somewhat different from performer to performer. Nevertheless, the different versions are recognised and appreciated by listeners as simply being different performances of the same tune. Before going into the details of the generative principles that govern this music, I will describe the instrument and the musical elements that musicians adopt in performance.

3.3.2 Eight-bass organetto

The diatonic button accordion, known in Calabria as the *organetto*, is present in the object area of this study almost solely in its eight-bass version.[9] The instrument has spread through Central Calabria during the Twentieth century and has been slowly taking over a place that had been almost uniquely dominated by the *zampogna conflentana* (Guizzi and Leydi 1985; La Vena 1986; La Vena 2005).

Figure 3.8 and Figure 3.9 are diagrams respectively of the bass buttons (left hand) and the melody-buttons (right hand) of an *organetto* in *G*. The production of sound is bound to the direction of the bellows: the same button produces two different pitches depending on whether the bellows are opening or closing. In both figures, the upper halves of the circles denote the sound obtained when closing the bellows; the lower half, the sound produced when opening them. In Figure 3.8, small letters denote a single pitch, in this case the fundamental of the corresponding

[9] In fact, many of the *sunate* of Central Calabria take advantage of the harmonic and melodic solutions offered by the lower register of the bass keyboard.

chord. Capital letters indicate a chord: all major triads except for the inner-top A. This chord is usually minor, although it is common in instruments commercialised in Calabria that the corresponding button also produces a major triad.

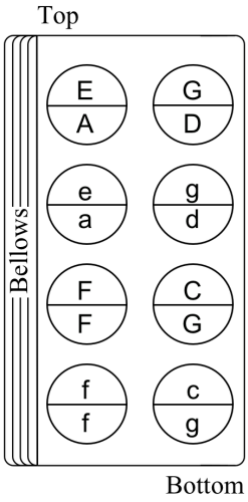


Figure 3.8 Bass buttons of an eight-bass organetto in G

Figure 3.9 shows the notes produced by the buttons of the melody keyboard. The Italian name for the buttons in the inner row – identified with circled numbers – is *vocette*, while for those in the outer row is *voci* (Giannattasio 1979). In Central Calabria, musicians do not distinguish between the two and refer to both with the term *vucette*.

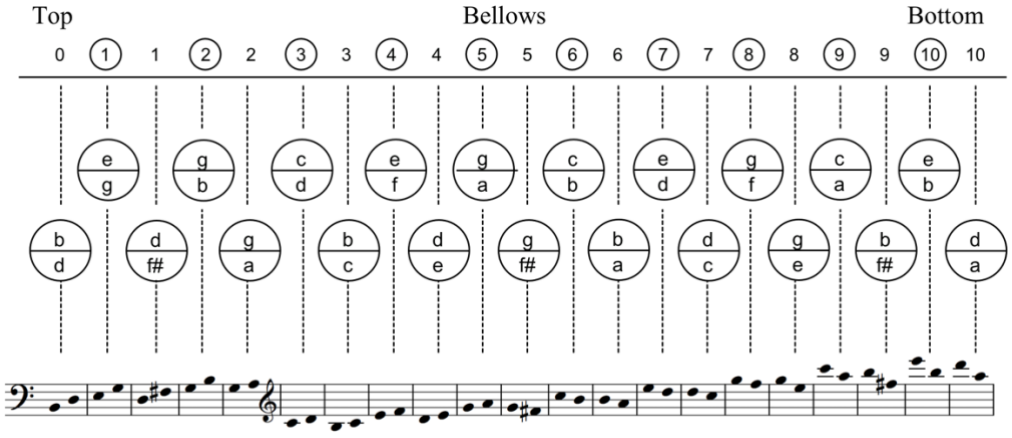


Figure 3.9 Melody keyboard of an eight-bass organetto in G

The instrument gives access to a limited range of modes and scales, and it lacks a full chromatic scale. Furthermore, when closing the bellows, only half of the notes

available on an *organetto* are accessible, while the other half are accessible when opening them.[10]

The organological features of the *organetto* work as a frame in which the musicians produce melodic variations. To overcome some of its limitations, players modify their *organetti* to respond to their creative demands. These modifications consist in the permanent inversion of reeds on a specific button and the swapping of reeds between two buttons.

To relate the transcriptions to the physicality of the instrument, I transposed the music to a key that matched the diagrams of the *organetto* provided in Figures 1 and 2.

3.3.3 Girate

Dance *sunate* work on the concatenation of short passages of music that last only a few beats. Musicians from Central Calabria refer to these short melodic fragments with the term *girata* (turn).

Girata is both a term and an object. As a term, *girata* can be interpreted as generically translating the phrase 'melodic fragment', since it refers both to a larger melodic construction and to its smaller constituents. As objects, *girate* are the melodic ingredients of a performance: finite melodic units with a clear internal structure – a start and an end – and a specific function. They are strung together to create longer melodic constructions that expand and contract without clearly defined patterns. *Girate* also seem to determine the shortest melodic duration conceptualised by musicians in the area: in fact, musicians never refer to melodic fragments that last fewer than two beats. *Girate* have flexible structure and duration: they can be a whole phrase or merely a shorter melodic cell with a determined function. They last no fewer than two beats, and stretch out to eight or more beats.

In practice, a *girata* can be a short self-standing passage, as in examples 1 and 2 in Figure 3.10; a whole melodic phrase, examples 4 and 5; or merely a two-beat passage used to connect other structural elements, examples 3 and 6. Example 5, despite being the same melodic fragment as example 4 with the addition of a pick-up figure, is described by musicians as a different *girata*.

[10] Inverting the direction also results in a change in harmony. Some virtuoso passages are obtained by inverting the direction of the bellows for a fraction of a pulse so that the regular alternation of chords, indissolubly linked to dance moves, is not interrupted.

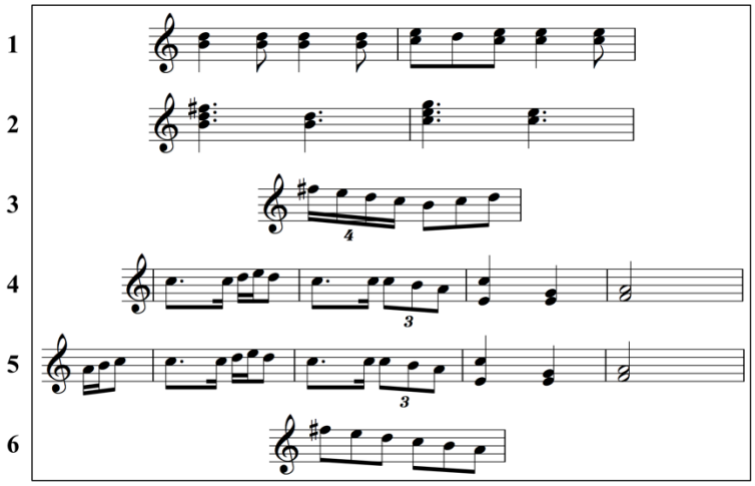


Figure 3.10 Examples of girate

Girate are the actualisations of underlying formulaic principles. However, it might happen that when asking a musician to play the same *girata* twice, the results might differ, although slightly. This seems to be connected to the act of remembering, intended as an active reconstruction of a personal perception of the salient details of an event – see for instance Leo Treitler's (2007) drawing on Frederic C. Bartlett's research (1995) – and to the embodiment of a variation practice, rather than to the definition of *girata* as a loose entity.

Musicians are well aware of these entities and of their functions. They can track the origin of specific *girate*, acknowledge from whom they picked them up, or explain which personal *girata* they added to a specific tune in order to personalise it.[11]

In this article, I will break the *girate* into fragments that last two beats for several reasons: the music analysed here revolves around the alternation of V-I chords each lasting two beats; the melodic fragments adopted in performance always appear in a specific harmonic area; this duration also has a correspondence in the dance, in which the dancers change step and alternate the supporting leg along with the harmonic changes; and ethnographic data show that the minimum duration conceptualised for a *girata* is two beats.

[11] Emblematic is an interview with Antonio Funaro, who pointed out how he introduced a *girata* of his invention in a sunata «made» by his uncle, to «modernize» the tune – «ammodernare».

3.3.4 Fina

An ideal starting point for the analysis of this music is Erminio Mastroianni's performance of *fina*, for it is an exemplary simplification of the processes at issue. I will first demonstrate how this *sunata* revolves around a single formulaic principle that is actualised into a series of *girate*. I will then demonstrate how the sequence in which these actualisations appear is regulated by real-time processes, and changes at every performance.

Fina is one of the main dance *sunate* of Central Calabria; it works on the alternation of V-I (G - C) chords in a major modal setting that allows the use of the augmented 4th – in this case the *f#* of button 9 in Figure 3.9 – as the major 7th of the V chord.[12]

Figure 3.11 is a transcription of the first few seconds of one of Erminio's performances.[13] I lay out the two-bar excerpts – a full alternation of V-I chords – so to have a vertical correspondence of the pulses in each *girata*. I delimit the pulses with a vertical line – dashed within the same chord; continuous when the chord change occurs.[14]

The vertical layout allows us to observe readily how each repetition corresponds to a common formulaic principle. Each harmonic area is characterised by a specific two-beat fragment, in the figure identified with **x** for the area of the V, and **z** for the area of the I. In Figure 3.11, **x2** is equivalent to **x1** with the addition of *c* as a passing note in the second beat. In **x3**, Erminio augments the bichord *b-d* with the addition of *f#* at the first beat, while he adds *e* as a passing note at the second beat. The same kind of variation is also observable in fragments belonging to group **z**.

[12] This sunata is named after the characteristic of using the highest register of the *organetto* – in fact, *fina* means 'high-pitched'. It is also known as *tribbucette* – three voices – since it mainly involves the use of only three buttons (⑥, ⑦ and 9) of the *organetto* – see Figure 3.9. Erminio calls it instead *quattruvucette* because he uses mainly four buttons (⑥, ⑦, ⑧ and 9).

[13] I recorded this performance on the 5th of August 2005 in a private session at Erminio's house and published the recording in my book on dance music (Ferlaino 2017).

[14] Here, as in the following transcriptions, I omitted the bass line since it plays a negligible role in the melodic variation discussed here.

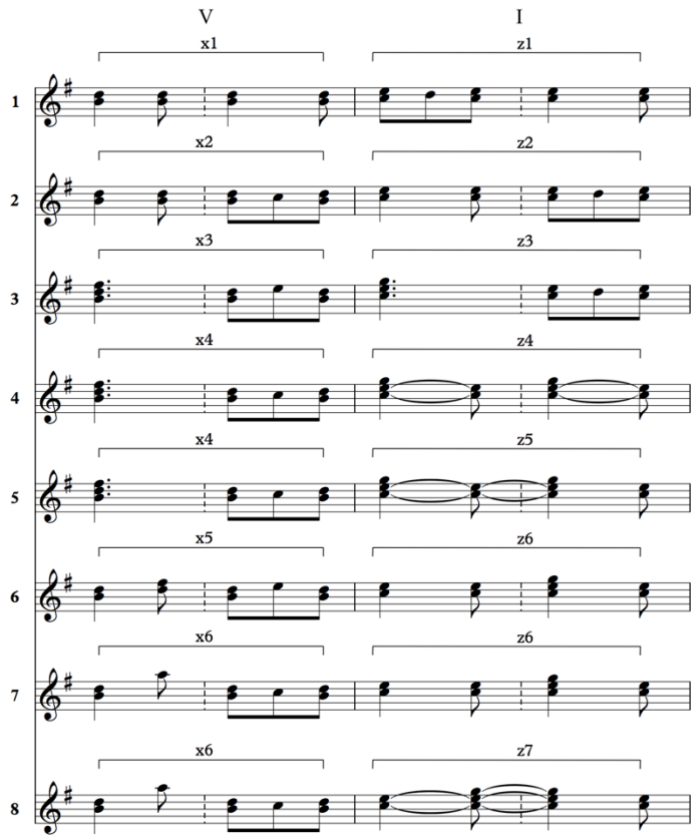


Figure 3.11 Opening 13 seconds of *fina* performed by Erminio Mastroianni

Naming **K** the two-bar *girate*, I rewrite the fragment above with the alphanumeric transcription in Figure 3.12.

K1 **x**1 **z**1	**K**2 **x**2 **z**2	**K**3 **x**3 **z**3	**K**4 **x**4 **z**4
K5 **x**4 **z**5	**K**6 **x**5 **z**6	**K**7 **x**6 **z**6	**K**8 **x**6 **z**7

Figure 3.12 Alphanumeric transcription of Figure 3.11

This transcription allows us to observe that at every harmonic cycle, Erminio performs different actualisations of a single formulaic principle **K**, formed by two fragments, each specific to one harmonic area. **K** can be described as in Figure 3.13.

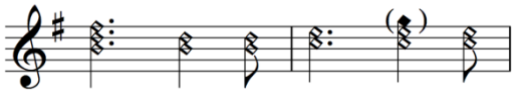


Figure 3.13 Formulaic principle underlying Erminio's *fina*

Thus, the whole performance is structured as a sequence of *girate*, each of which is a slightly different actualisation of the music fragment **K** transcribed in Figure 3.13. Italian ethnomusicologists define this process, based on the constant iteration and variation of underlying melodic structures, as *micro-variation* (see for instance Crivelli 1979; Lortat-Jacob 1989; Giuriati 1982). The underlying melodic/rhythmic structures are always preserved, while the surface changes at each repetition.

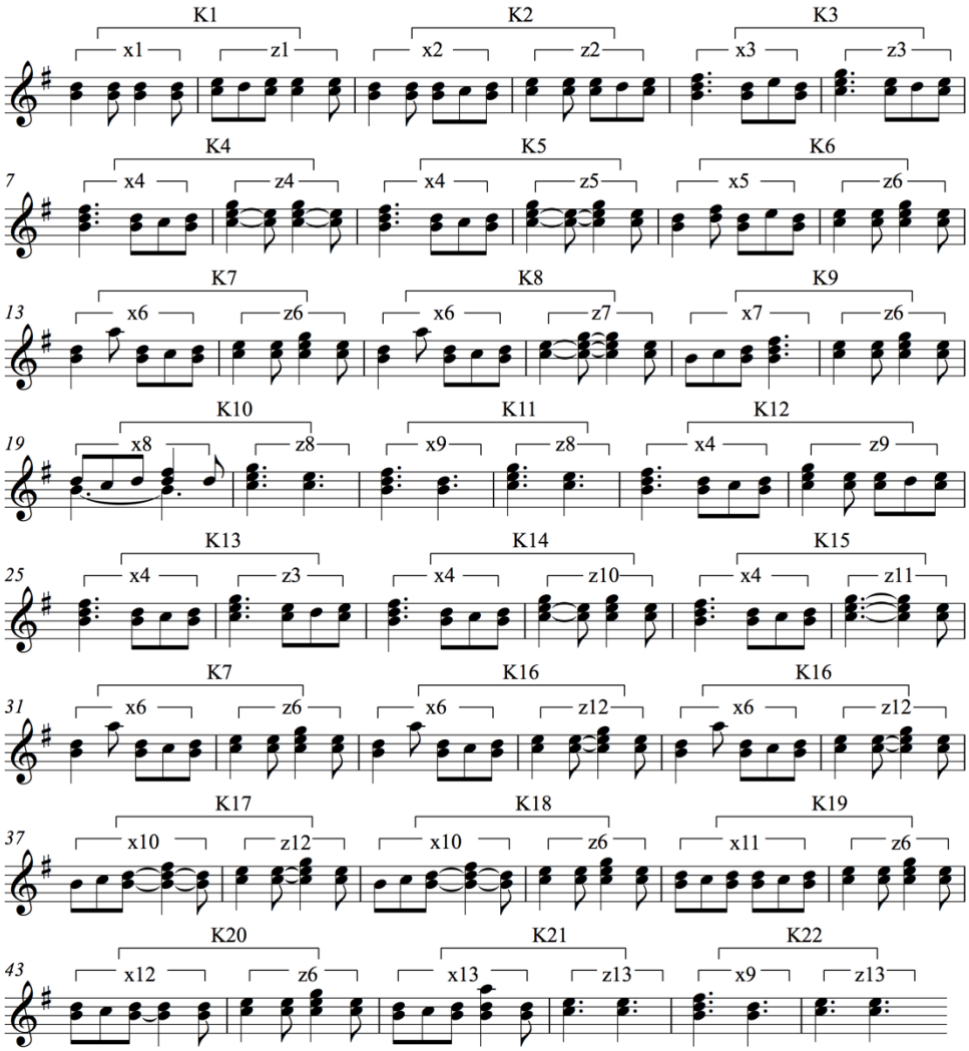


Figure 3.14 Initial 37 seconds of Erminio's first performance of *fina*

To observe the extent of this variation process, I transcribe the first 37 seconds of the same performance of *fina* in Figure 3.14. Erminio realises **K** 24 times: 22 are new versions, whereas 2 are exact repetitions of a version that had appeared previously – **K**7 and **K**16. We also notice that the *girate* are constructed using a handful of elements: in this case, 13 versions of **x** and 13 of **z**, recombined in different ways.[15]

Calabrian musicians are well aware of this variation process although they do not verbalise it explicitly in a structured way. It emerges in the way Calabrian musicians evaluate their performances. In fact, listeners and musicians appreciate variation: performers with a limited repertoire of *girate* are regarded negatively as playing "always the same thing" or "only a few *girate*".

The sequence in which *girate* appear in a performance is not fixed or predetermined: a *sunata* is not recollected from memory as a whole, nor as a strophic music piece made of a predetermined sequence of melodies. Instead, it results from an undetermined number of actualisations of the underlying melodic structure, which are strung together and recombined in real time. To observe how different successions of *girate* emerge in different performances, I will now compare the previous transcription with the first 37 seconds of another performance of Erminio's *fina*[16] in Figure 3.15.

In this second version, new *girate* and new realisations of **x** and **z** appear. However, most of the actualisations of **x** and **z** are in common with those of the version transcribed in Figure 3.14. This time, Erminio repeats more *girate* than in the first version: **K**27 appears five times, **K**11 and **K**16 appear twice each. Most important for this analysis, the sequence in which he strings together his *girate* is entirely different.

[15] Giuriati's analyses identify a lower level of variation within the duration of one beat. He shows how variation at higher melodic levels is produced by variating and recombining only a few small one-beat melodic fragments. The same economy of means can be recognised in Calabrian music. Each *girata* consists of one **x** and one **z** which are respectively formed of the repetition and variation of two one-beat figures, one for **x** and one for **z**.

[16] This performance was recorded by Andrea Bressi in a private session at Erminio's house on the 23rd of September 2017.

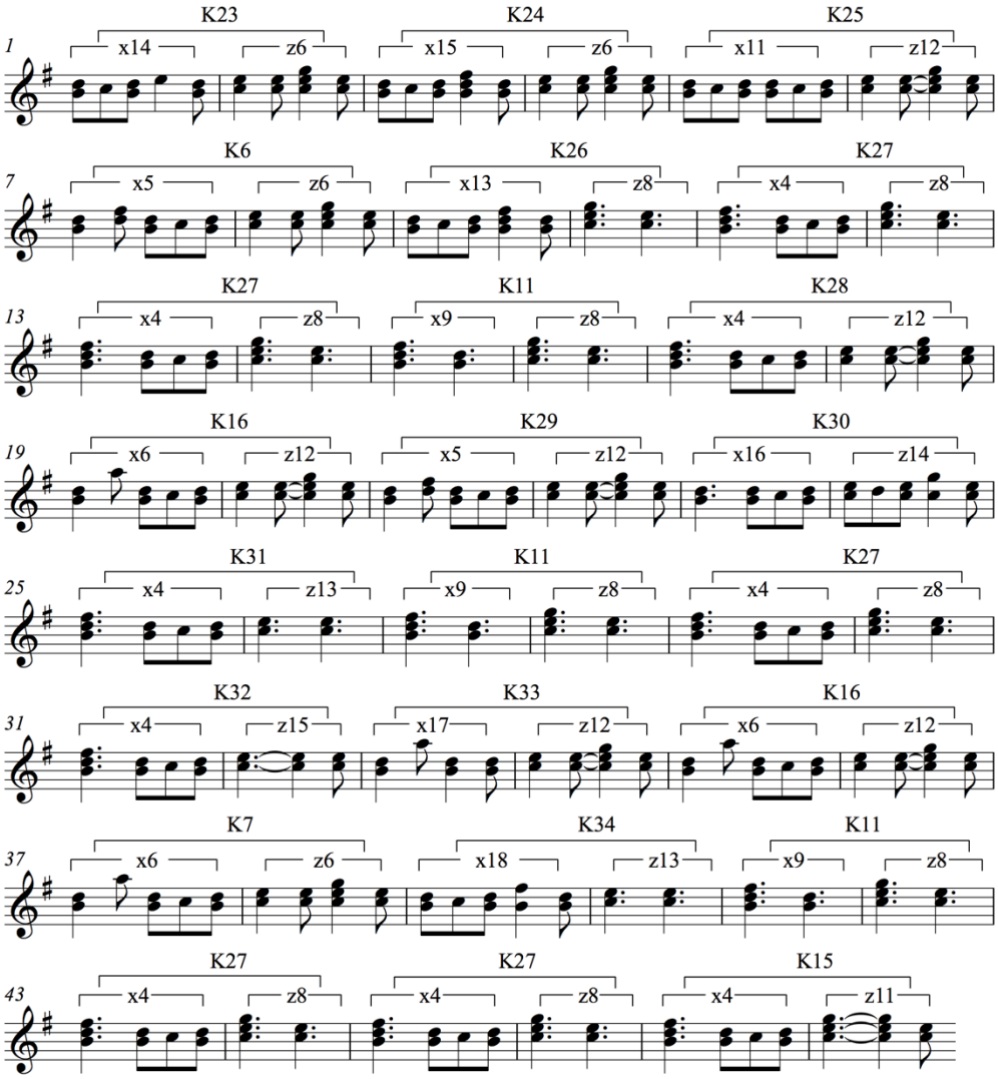


Figure 3.15 Initial 37 seconds of Erminio's second performance of *fina*

For easier comparison, I lay out the two versions using alphanumeric transcription in Figure 3.16. We can observe that the order of the *girate* changes at each performance. Thus, the form of a *sunata* is determined by the perpetual real-time recombination of micro-varied melodic shapes.

Musicians are aware of the variability of both *girate* and sequences. Erminio for instance, when speaking of the way this music works, says that the *sunata* is "always the same thing" – «chiđđa sempr'a stessa è» – and that you play it "as it comes [to you]" or "as it happens" – «cumu vene».

Version transcribed in Figure 3.14.

K1	**K**2	**K**3	**K**4	**K**5	**K**6
K7	**K**8	**K**9	**K**10	**K**11	**K**12
K13	**K**14	**K**15	**K**7	**K**16	**K**16
K17	**K**18	**K**19	**K**20	**K**21	**K**22

Version transcribed in Figure 3.15.

K23	**K**24	**K**25	**K**6	**K**26	**K**27
K27	**K**11	**K**28	**K**16	**K**29	**K**30
K31	**K**11	**K**27	**K**32	**K**33	**K**16
K7	**K**34	**K**11	**K**27	**K**27	**K**15

Figure 3.16 Alphanumeric transcriptions of Erminio's performances of *fina*

Musicians bring to life the shared melodic shapes underlying a *sunata* in a multitude of varied versions. Variation works within a specific model defined by culture and memory. These two work as a frame within which music takes place, binding the performer's creativity to the available cultural means – "always the same thing". The performer's creative need takes advantage of music made of pre-existing materials that are recollected from memory and constantly transformed. Recalling music from memory is fundamental to oral traditions (Treitler 2007), and it gives the repertoire a very dynamic character. The music analysed here results from the perpetual reinvention and re-aggregation of stereotyped elements (Magrini 1988) – "as it comes". Erminio's words hint at the type of generative principles that govern this music. His reference to a stable model that comes into being in real time in a variable and unpredictable way recalls the process of acting *extempore* on a well-defined and highly regulated, virtual model described by Vincenzo Caporaletti's concept of *extemporisation* (Caporaletti 2005).

The performers draw on a repertoire of *girate* that has been worked out over time. At the same time, they rely on a profound knowledge of the system that governs the music. At an expert level of skill acquisition (H. Dreyfus, Dreyfus, and Athanasiou 2000), the performer has a holistic perception of the rules and materials involved in music-making that is thus actualised intuitively in the performance. The generative principles observed here encourage the development of extemporisation

skills that allow the musicians to manipulate the musical material in the course of performance by acting on a memorised model. This process results both in the exact recollection of *girate* previously memorised and the "creation" of new ones in real time. The performers extemporise both the creation of *girate* and the sequence in which they appear in a performance.

This analysis also shows the extent of what I previously called *economy of means.* The whole performance is constructed with one four-beat melody. The melody itself is also made of very limited musical elements: the *girata* consists of one **x** and one **z** which are respectively formed of different versions of two one-beat figures, one for **x** and one for **z**. Furthermore, as said earlier, the whole performance is played with four buttons of the melodic keyboard of the instrument.

The analysis of Erminio's *fina* provides an insight into music that revolves around a single melodic shape that is iterated and varied, similarly to what has emerged in research on bagpipes from the area (La Vena 2005). In *sunate* like *fina*, the generative processes of bagpipe music presumably migrated to the newly introduced instrument. However, the *organetto* offers access to a much higher number of notes and "harmonic" solutions than the local bagpipes. We can speculate on how these aspects may have triggered the differentiation of the repertoires for these two instruments: evidence points towards the development of the bagpipes' modularity into a process that took advantage of the extended possibilities offered by the *organetto* (Ferlaino 2017).

3.3.5 Quattrubassi

To show how the processes discussed earlier took advantage of the new possibilities offered by the *organetto,* I will now analyse the *quattrubassi.* In this *sunata*, musicians string together different fragments into more extended melodic constructions through an accumulative process. In the following analyses, I will focus only on the melodic types that the players utilise in performance, rather than on their actualisations. These analyses are meant to demonstrate how modularity works in more complex *sunate* and to discuss the degree of variability that emerges when different musicians play the same piece.

Figure 3.17 is the transcription of an excerpt of Antonio Sposato's *quattrubassi*.[17] This *sunata* alternates V-I chords – C and F in Figure 3.8 – every two beats in a major mode with the augmented 4th.[18] I analyse the piece as a series of musical phrases of different lengths which conclude with a cadenza in bichords (**Q**). As I will illustrate later, ethnographic and auto-ethnographic data corroborate the choice of the cadential bichords **Q** as the key analytical tool for this *sunata*. I omitted the first 24 bars from the transcription because they were repetitions of the melodic materials of bars 25–32. The length of the phrases is: [4 - 4 - 4 - 4 - 4 - 4] - 4 - 4 - 8 - (2 - 2 - 2 - 2 - 2). The last five two-bar cells could also be considered as a longer 10-bar phrase that ends with the long, resting, tone in bar 50.

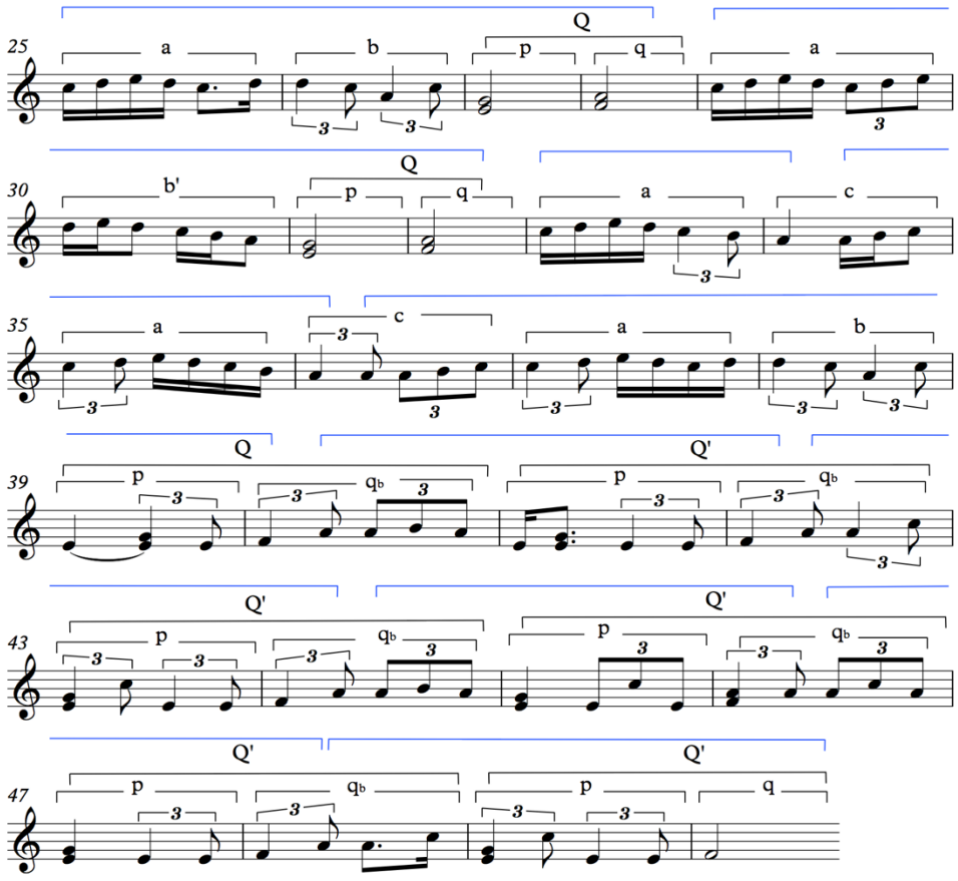


Figure 3.17 Excerpt of *quattrubassi* as performed by Antonio Sposato

[17] I recorded this version on August 2, 2005, during a private session at Antonio's house.

[18] The *sunata* is named after the technical feature that requires the performer to use the lower four bass-buttons of the organetto: the external when closing the bellows and the internal when opening it. It is also known as *cuχχentara*, from Conflenti, the place where it originated.

Antonio constructs his melodies through variations of the fragments **a**, **b**, **c** and **Q**, which in its basic form consists of **p** and **q**. **Q** is also stretched out melodically in the five repetitions. There, Antonio combines **q** with materials that could be considered derivations of **b** – labelled $\mathbf{q}^{b}$ – for their melodic shape and their function of preparing the cadenza.

Leo Treitler speaks of *formulae* as stereotyped musical entities with a specific function, and which can appear in specific positions of a broader musical phrase (Treitler 2007). *Formulae* have stable salient features, while other elements are susceptible to variation. They manifest as musical objects that are "virtually the same" (175). We can analyse **Q** as a recurring formula whose function is to conclude the longer melodic constructions. This feature will become even more evident after comparing this performance with others by different players.

In the rest of the performance, Antonio keeps expanding and contracting his phrases without a determined pattern, although the 4-bar melodic constructions are predominant; he also introduces new melodic materials.

The piece can be transcribed with the sequence:

[abpq ab'pq abpq ab'pq abpq ab'pq]
abpq ab'pq acacabpq^{b} pq^{b} pq^{b} pq^{b} pq^{b} pq

This *sunata* makes use of a higher number of melodic materials compared to the music analysed earlier. While in the *fina*, a single two-bar melodic shape was iterated and varied, in the *quattrubassi*, different melodic fragments are strung together in various combinations. We can observe recurring patterns in the way Antonio sequences the melodic fragments. Each fragment appears only in one harmonic area: **a** and **p** are specific to the harmonic area of the V, whereas **b**, **b'** and **q** are specific to the area of the I. They also hold specific functions within the longer phrases: **a** always starts the melodic constructions whereas **Q** always concludes them; **c** connects different fragments – it is used to return to **a** to stretch out the melodic constructions; **b** and its derivation **b'** always prepare the cadenza.

With blue brackets, I also try to show how a folk musician would empirically divide the piece into *girate*. This interpretation is purely speculative and derives from observations and conversations with musicians from the area. As it appears from the transcription, the durations of the *girate* expand and contract in different ways, even when the constructions derive from similar materials. Far from providing a clear picture of their structure, this interpretation emphasises how modularity –

intended as stringing together smaller elements into larger constructions – is not only mere analytical speculation, but it is clearly conceptualised in the emic theory of music.

To show how the *sunate* vary considerably from performer to performer, I now compare Antonio Sposato's *quattrubassi* with versions by two other musicians: Carmelo Scalese – in Figure 3.18 – and Antonio Funaro – in Figure 3.19.[19] Differences between these three performances emerge in the division of the beat and in the metric interpretation. Even more significant differences are observable in the actual melodies played and their developments.

While in Figure 3.17, we saw melodies of variable length, in Figure 3.18, Carmelo Scalese constructs phrases that always last 4 bars, and his whole performance adheres to this structural arrangement. Yet, it is possible to recognise materials derived from the same *girate* used by Antonio Sposato along with new ones. Although most of Carmelo's phrases start with *b* instead of *c*, the melodic figures respond to a common formulaic system which makes it possible to relate them to fragments **a**.

[19] I recorded Carmelo Scalese's version on July 2005, Antonio Funaro's on December 28, 2005: both during private recording sessions. Both pieces are published in Ferlaino (2017).

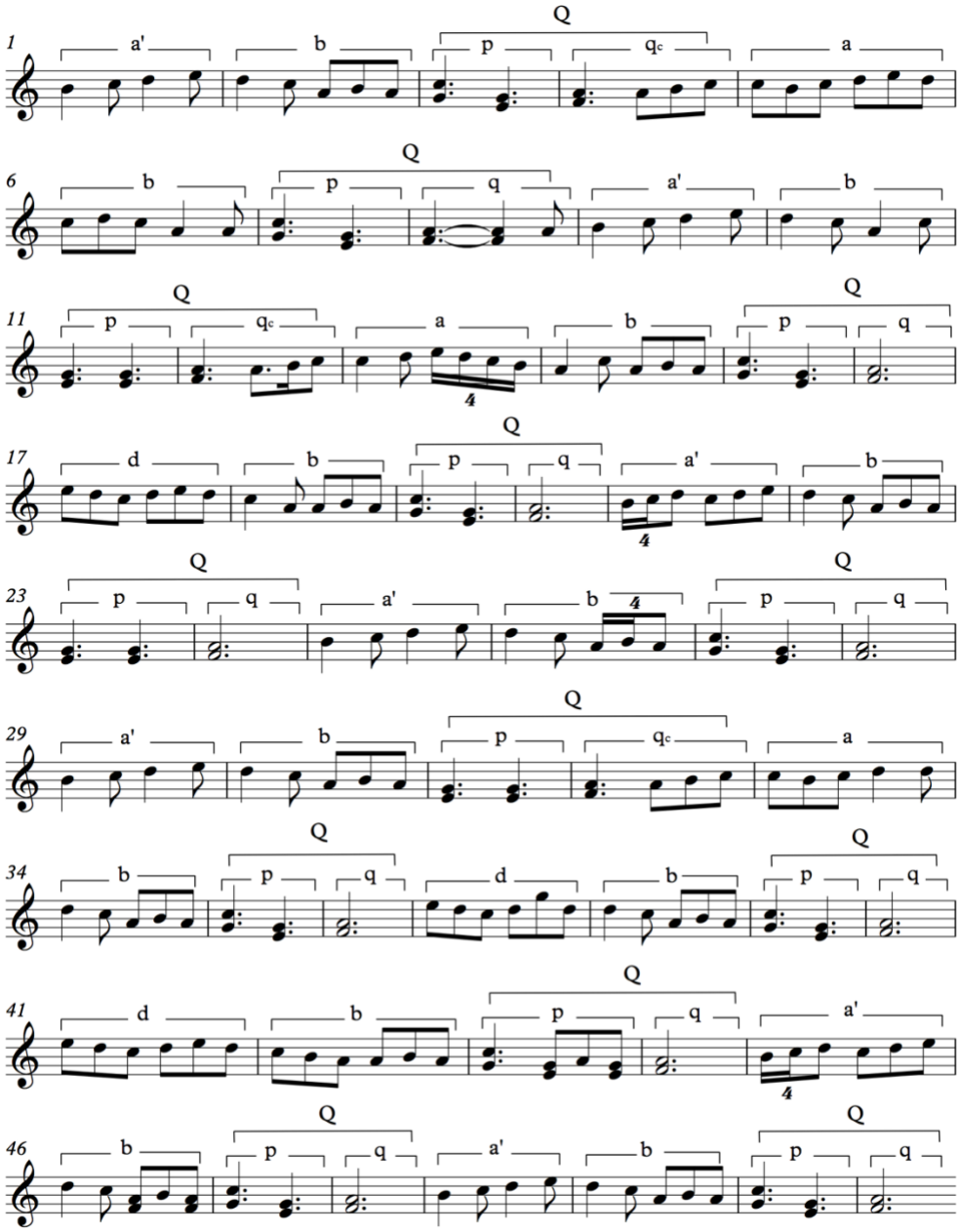


Figure 3.18 *Quattrubassi* performed by Carmelo Scalese

The piece can be transcribed as follows:

a'bpq^{c} abpq a'bpq^{c} abpq dbpq a'bpq a'bpq

a'bpq^{c} abpq dbpq dbpq a'bpq a'bpq

Carmelo uses two different fragments to start his melodic constructions: **a**, its variant **a'**, and **d**. In this version, Carmelo combines **q** with melodic materials whose shape and function can be associated with fragment **c** of Figure 3.17: in fact, **q**^{c} is a

composite fragment that combines the cadenza with a pick-up figure that reconnects to **a**.

Antonio Funaro's *quattrubassi*, Figure 3.19, introduces a new complexity and variety, as well as a higher variability of phrase duration.

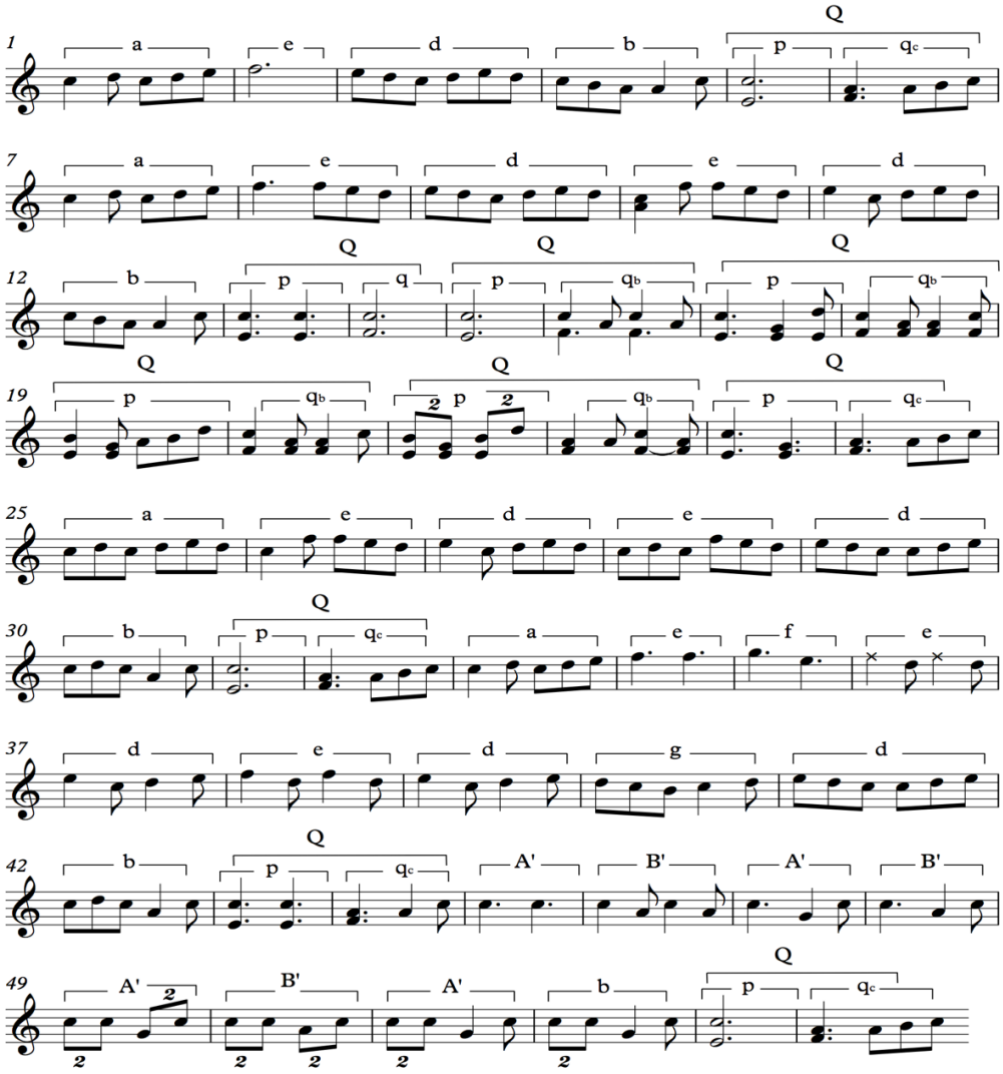


Figure 3.19 Excerpt of *quattrubassi* performed by Antonio Funaro

His melodic constructions last 6 - 8 - 2 - (2 -2 - 2 - 2) - 8 - 12 - 10 bars. In the rest of his performance, Antonio constructs phrases that expand and contract without a constant pattern. The sequence in brackets can be analysed as a melodic elaboration of **Q,** in which elements are arranged together to construct a longer 8-bar phrase. The piece can be transcribed as follows:

aedbpq^{c} aededbpq pq^{b} pq^{b} p'q^{b} p'q^{b} pq^{c}

aededbpq^{c} aefededgdbpq^{c} A'B'A'B'A'B'A'bpq^{c}

Antonio Funaro introduces new melodic material: **e**, **f**, **g**, **A'** and **B'**. Materials belonging to **a**, **d**, **f**, **p**, and **A'** pertain to the harmonic area of the V, whereas **b**, **e**, **g**, **q**, and **B'** are appropriate to the area of the I. Antonio constructs more complex lines, with a composite internal structure: for instance, through the connecting element **e**, he repeats parts of his lines and stretches the constructions – **g** plays a similar role.

A' and **B'** seem to be derived from **a** and **b**, although their function and provenance are very different. Antonio borrows these two fragments from a different piece for *organetto* called *zampognara*.[20] The adoption of *girate* that belong to different *sunate* is a common practice in dance repertoire for *organetto*.

In music like the *quattrobassi*, we recognise a set of melodic materials, governed by common formulaic systems (Treitler 2007), that are recombined continuously in real time into ever-changing melodic constructions. Giovanni Giuriati (1982) compares the micro-varied recombination of melodic fragments to the glass particles of a kaleidoscope: a handful of elements are continuously recombined to give birth to ever-changing shapes.

Only a few fragments are shared among the three performers: **a**, **b**, **p** and **q**. Furthermore, every musician has a different and personal way of interpreting these fragments into actual *girate*. For instance, Antonio Sposato and Antonio Funaro's *girate* **a** always start on *c*, whereas in Carmelo Scalese's performance they often start on *b* in the variant **a'**. Other melodic materials are less commonly shared differences: for instance, fragments **d** and **e** are absent in Sposato's performance, who instead is the only one that uses the full version of fragment **c**. Only Funaro uses **f** and **g**, and he is also the only one who borrows materials from different *sunate* (**A'** and **B')**. Furthermore, Sposato plays with a pronounced binary character while the other two have a distinct ternary division of the beat. Players personalise the actualisation of the melodic shapes according to their taste, skills and musicianship.

[20] The *zampognara* is a *sunata* that imitates the melodic ambit of the *zampogna* and its *girate*. Although the *zampognara* is played in a different register of the *organetto* (the upper external bass-buttons, D-G in figure 1), Antonio adopts its melodic materials to add variety to his performance. Sometimes musicians do not transpose these borrowings, which therefore produces interval and harmonic clashes that are very much appreciated by the musicians from the area.

3.3.6 Identity of the *sunate*: with two fingers at the same time

The preceding analyses show how musicians sequence and repeat through variation extemporised melodic structures. This is true both for *sunate* that revolve around a single *girata* and for music that involves different melodic fragments. Ethnographic data also show how the musicians perceive the *sunate* as the real-time actualisation of a stable and clearly defined model. However, the analysis of *quattrubassi* shows a considerable degree of variability among performers. Musicians do not share the pieces as a whole, nor do they share fixed melodies, which instead vary considerably from performer to performer. Despite the differences emerging in the analyses, musicians and listeners recognise the three performances as simply being different versions of the very same piece, in which they acknowledge the performers' signatures. With such a degree of variability, questions arise concerning the perception of the identity of a *sunata*. How can different performances of the same piece show such a significant variability and still be perceived as responding to the same stable model – "always the same thing"? Where does this identity reside? The "principle of likeliness" (Treitler 2007) among the three performances seems to reside in the adhesion to an underlying model, rather than in the surface manifestation, which may vary. However, is the identity perceived as the adhesion of all the musical elements involved in performance to a holistic model underlying a specific *sunata*, or rather are some elements more important in defining the piece's identity? This second case would explain why some fragments can be excluded from a performance without jeopardising the piece's identity; or why borrowings are perceived as an "enrichment" of the *sunata* rather than a change to a different one – which in the area is referred to as *vutare* (turn into). Ethnographic data support this second option.

At a banquet, two musicians present at the table asked me to play a *sunata*. As an inexperienced accordion player, I reproduced the melodies I had learned by imitating one of the two musicians. I was extremely disappointed by their laughter as they were mocking my playing. When asked, the musicians replied that I was playing something similar to a *quattrubassi*, but not quite that tune. They explained that my piece «sounded like» a *quattrubassi* but was not, the reason being that I was missing the bichords in the cadenza: «you have to press two buttons [at the same time].» Evidently, the cadential bichords are the most characteristic element of this *sunata*, since I was playing melodic shapes that correctly belonged to it,

although I concluded my constructions with a monodic cadenza. Figure 3.20 shows the kind of material that was, and was not, considered *quattrubassi*.

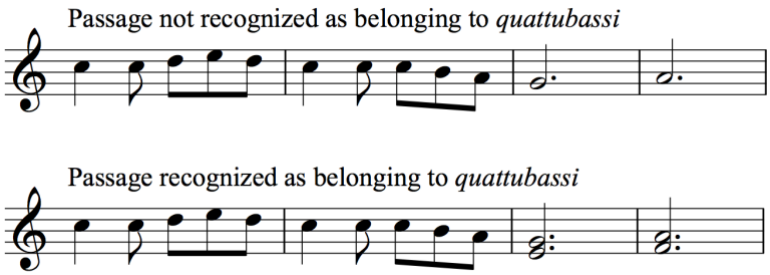


Figure 3.20 Passages I was playing at the banquet

The musical elements used in a *sunata* thus have a different significance in defining its identity. Often there seems to be one indispensable characterising element, in the absence of which the *sunata* is not fully recognised.

In the case of the *quattrubassi*, the most characteristic element is the cadential bichords **Q**, which conclude the melodic constructions. Without the bichords, the piece does not sound to the ear of folk musicians like a *quattrubassi*.

One more example, this time concerning the *fina*, could help to strengthen this argument. During the recording session, the four bass *organetto* player Giuseppe Mazza proposed to play the *fina.* To express his intentions, he said «Do you want (me to play) the one they play in Conflenti? This one:», followed by the fragment transcribed in Figure 3.21

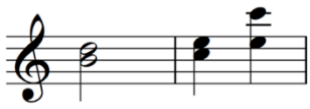


Figure 3.21 Music fragment played by Giuseppe Mazza to describe *fina*

This fragment – which resembles very much the structure which appears to underlie Erminio's *fina* transcribed in Figure 3.13 – seemed, for Giuseppe, enough to express his intentions and explain which piece he was about to play. Afterward, he played the tune[21] transcribed in Figure 3.22.

[21] It is also noticeable that the version played by Giuseppe Mazza uses the major 4th (*f*) instead of the augmented fourth (*f#*), which usually characterises this *sunata*. Giuseppe, in fact, used to play a four-bass accordion which does not feature the augmented fourth, as does the eight-bass accordion normally played in the area. Nevertheless, this does not seem to affect his performance of this piece, which is still recognised and appreciated as being the *fina*.

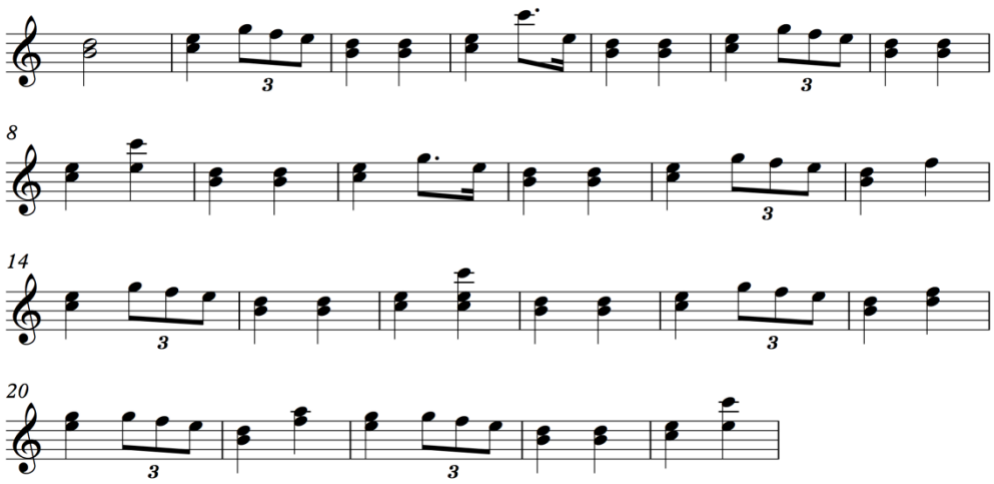


Figure 3.22 Giuseppe Mazza's *fina*

The melodies deployed during the performance seemed to be less explicative and less important in defining the identity of the *fina*. The whole *sunata*, for Giuseppe, could be condensed into the short passage of Figure 3.21.

One further example also concerns the *fina*. At a public gathering, I observed an accomplished musician "correcting" a novice while she was performing this *sunata*, Figure 3.23. The less experienced performer was playing "wrong" *girate* because she was missing one bichord. The elder musician stressed the importance of playing the characteristic element of the *fina* correctly: «you have to play with two fingers [at the same time]».

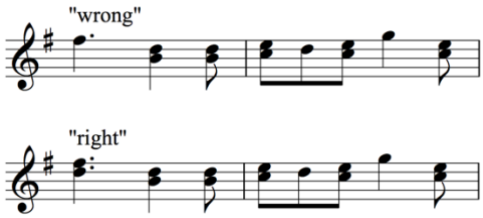


Figure 3.23 Melodic fragments deemed wrong and right for *fina*

We can speculate here on a generative principle that works with different orders of materials. Musicians from the area share different fragments that they string together in real time to perform a *sunata.* Some of these elements are fundamental and indispensable for defining the identity of a *sunata*: this is the case of the characteristic elements labelled as **Q** in *quattrubassi* and **K** in *fina*. These musical elements appear to be more important than the melodic constructions of which they are a part: if they are absent or not correctly played, the identity of the *sunata* is not fully recognised. This characteristic is at odds with the current studies on modularity

in Central- and South-Italian music. Researchers identify the tunes with the melodies resulting from modular processes. While this may be true for the music objects of those studies, in the music of Central Calabria, some elements are more important for defining the identity of the tune than the resulting melody of which they are parts. This explains why, despite the almost complete correspondence between the two melodies in Figure 3.20, musicians would recognise only the second one as *quattrubassi*.

Other elements are indispensable for and unequivocally associated with a *sunata* although they are less important than the key elements for defining its identity. These are shared among all musicians. They hold specific functions within the melodic constructions of which they are the building blocks – for instance, fragments **a** and **b**.

Some *girate* are shared among only a few musicians or are characteristic of a specific player. Although uniquely associated with a *sunata,* these *girate* play a negligible role in defining its identity. Their presence, or absence, does not affect the sunata's identity as in the case of elements such as **d**, **e**, and **f**.

Borrowings – such as **A**' and **B**' – are also accepted and appreciated. Indeed, all *girate* are mobile, as they can migrate to enrich the melodic developments of any *sunata* without undermining its identity.

3.3.7 Conclusion

The generative processes discussed here have been traditionally passed on by immersion and active participation in the musical life of the region. During the 1960s, profound changes occurred in the Calabrian social structure following the economic boom: they introduced new training methods and aesthetic models which contributed to reducing the social space in which this music had been functioning. The traditional participatory, collective musicking (Small 2011) started to coexist with the audience-performer duality of the concert setting. At the same time, a literal, vertical teaching method – through which *sunate* and *girate* are taught note by note, although still mostly in a context of oral transmission – partially replaced the traditional training method based on imitation. The musicians who learned through the note-by-note method are more likely to play *sunate* as a predetermined sequence of rather fixed melodies. This neglect of the socially acquired generative processes of this music leads to a reduction of *modularity* and *micro-variation* into

more fixed melodic structures. In some extreme cases, it is possible to observe two musicians who play a *sunata* in perfect unison: an almost impossible task for those who learned by imitation. Traditionally trained players would instead actualise the melodic shapes independently, thus producing a musical output that aims “at a maximum of sonorous quality, which is obtained by summing up every kind of sonorous source” (Magrini 1989, 91).

Bernard Lortat-Jacob (1989) describes the modular process as a tree, where modules would branch out into variations, which would then sprout in turn. He depicted the transformation of the fluid form of Calabrian music into a fixed, strophic one as that of a tree that loses its branches. For years, this seemed to be the fate of the music described in this paper. However, recently a new generation of musicians has arisen who are rebuilding the links with the older generations. Thanks to a genuine interest in its generative processes and teaching methods, this music is slowly winning back its social role in the public space. Older and younger generations have come together once again and re-established a participatory and public performance practice that has injected new vitality into the repertoire. The “arousal of a new or renewed creativity” (Lortat-Jacob 1989, 164) maybe will make the tree green again.

The concepts discussed here, *economy of means* and *modular micro-variation,* became the foundation of two of my compositions, as well as informing most of the pieces discussed in this thesis. The real-time processes of music creation opened a path for investigation into improvisation that I addressed in *Bad Habits*, the saxophone solo that I discuss in Section 5.1. I also investigated *micro-variation* and *economy of means* from the perspective of structured composition in *High and Subtle*, the composition for chamber ensemble that I describe in Section 5.2.

3.4 Calabrian bagpipes and their tuning system

Bagpipes are among the main musical instruments in Calabria; their prestige and presence in the region have been diminished only by the relatively recent introduction of the diatonic accordion. Despite the competition against this rather modern, industrial instrument and the shrinking and marginalisation of the agro-pastoral society, bagpipes still hold their prestige in Calabria. Bagpipes are present in a great variety of models and types, more than in any other Italian region.

Bagpipe music, the instruments' sound systems, technology and aesthetic models still retain features remarkably different from the values of modern Western music.

My fascination with bagpipes dates to my teenage years, when I undertook my training by following and imitating the elders in my birthplace. I learned the repertoire and the technical aspects of the instrument. I learned how to make the reeds and the related knowledge: how and where to choose the right cane, how to cure and season it and how to cut the reed itself. I also learned to prepare the instrument, therefore to choose the right set of reeds and to process them in order to obtain the desired sonic balance among the pipes. Under the directions of my mentors, my training included empirical experimentation with a set of knowledge that concerned the acoustics of the instrument and the tuning techniques. During my ethnomusicological research on dance music, I observed how the procedures associated with making the reeds and tuning the instrument were informed primarily by cultural factors, as differences emerged according to geographical areas. The different procedures, rather than merely being functional activities for getting the instrument ready to play, require refined musical skills and are attributed strong cultural significance so that they can be studied almost as a repertoire in their own right.

This section discusses the technical features of Calabrian bagpipes, with a special focus on the tuning system and process of the single-reed instruments. At first, I describe the different models of bagpipes present in Calabria and discuss their respective peculiarities. Afterwards, I describe the acoustic properties of the single reed and their influence on the organology of the instruments. The study of the acoustic properties of both reeds and instrument is supported by computer-based pitch and spectral analysis. I also discuss how these properties are oriented by cultural choices that emerge in the tuning process. In conclusion, I illustrate how such a functional activity as tuning is governed by musical processes. The techniques described here informed the composition of three pieces – discussed in Section 5.3 – that explore the tuning process and the tuning system of the *surdulina* bagpipes.

3.4.1 Calabrian pipes

In the landscape of Italian bagpipes, Calabria stands out for variety and diversity. The imposition of new social and economic models, which occurred with the economic boom in the 1960s, caused the shrinking and marginalisation of the agro-pastoral society – the elective space of bagpipes – and wiped out a huge number of Italian bagpipes. However, despite the profound transformations occurred in the region, Calabria preserved in use most of its indigenous instruments. Considering the variety of types found and their distribution throughout the region, bagpipes are among the most important instruments in Calabria. The variety of models is equalled by the instrument's vast repertoire, which embraces almost every musical ambit in the region. There are four big families of bagpipes in Calabria: *a chiave*, *surdulina*, *a paro* and *a moderna*. All of them belong to the bigger family of Central and Southern Italian bagpipes, in which all the sounding pipes are attached to a carved piece of wood called the *stock* (Guizzi and Leydi 1985; Leydi 1979; Leydi and Guizzi 2002). Each of the four families of Calabrian bagpipes is then differentiated in various types according to organological features such as the instrument's shape, the pipes' inner bore, acoustic properties and differences in the sound activation systems or in the fingering. This study being mainly concerned with the acoustic properties of bagpipes, I avoid detailed descriptions of the instruments' morphology.

The *surdulina*, found in the northern area of the region, is present in four different types: *surdulina of the 1st kind*, *of the 2nd kind*, *conflentana* and *stifetta* (La Vena 1986). They are all single-reed instruments with cylindrical bores, and consist of two melodic chanters of the same length and two drones (sometimes three in the *stifetta*). *Surduline* are all characterised by the occlusion of the left-hand chanter at the distal end, a characteristic that makes this instrument peculiar among European bagpipes. The occlusion allows the piper to interrupt the sound when closing the chanter's four finger-holes. The performing technique alternates the closed holes with fingered positions thus allowing pipers to play staccato and rests. The reeds, all single and idioglot, are cut from top to bottom out of a piece of cane *Arundo Donax (L)* by following the natural growth of the plant, see Figure 3.24.

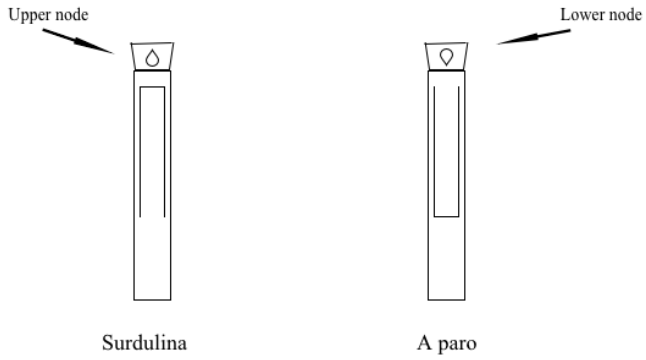


Figure 3.24 Single reeds of Calabrian bagpipes

Despite the morphological and acoustical differences among the four types (see for instance, La Vena 1986; 2002; 2003; 2005), the instrument is tuned as shown in Figure 3.25. The right chanter has four finger-holes plus one or two tuning holes whereas the left chanter has four finger-holes, Figure 3.26.[22]

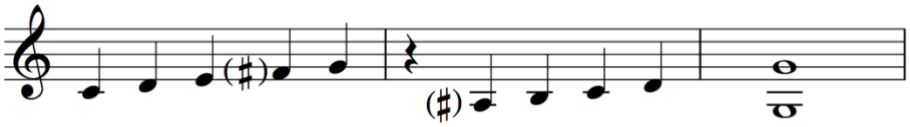


Figure 3.25 Scalar system of the *surdulina* bagpipe

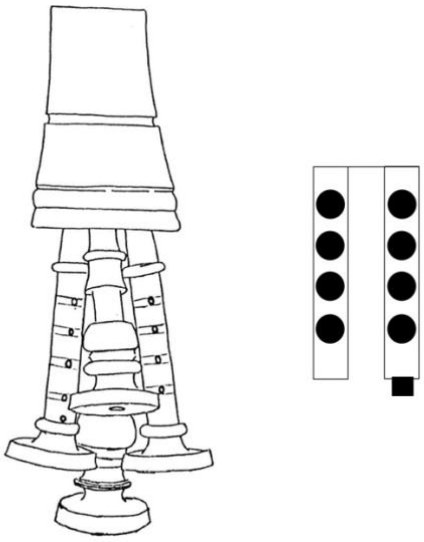


Figure 3.26 *Surdulina of the 2nd type* and position of its finger-holes

[22] The images of *zampogne* in this pages are all taken from Guizzi, Febo. 2002. *Guida Alla Musica Popolare in Italia*. Vol. 3. Lucca: LIM.

The *zampogna a paro*, found in the southern part of the region, is a bagpipe made of four sounding pipes (sometimes five, rarely six): two chanters of the same length and two or more drones (Cravero 2006). All pipes have conical bores except for the lower drone whose bore is cylindrical.[23] The instrument can be found in three different types depending on the sound activation system: featuring all single reeds, featuring double reeds, and featuring mixed reeds. Instruments of the second and third kinds are considered modern versions of the old all single-reed model (La Vena 1994). The single reeds of this instrument are all idioglot, cut from bottom to top out of a piece of cane. The cut is made in opposition to the plant's natural direction of growth. The tuning system of the instrument is shown in Figure 3.27. The right chanter has four finger-holes, one thumb hole, and one or two tuning holes; the left chanter has four finger-holes, Figure 3.28.

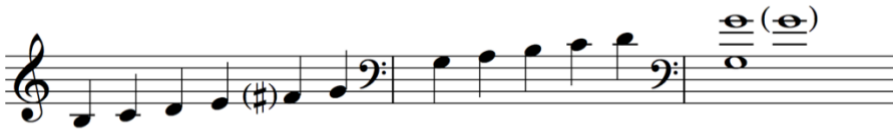


Figure 3.27 Scalar system of the *a paro* bagpipe

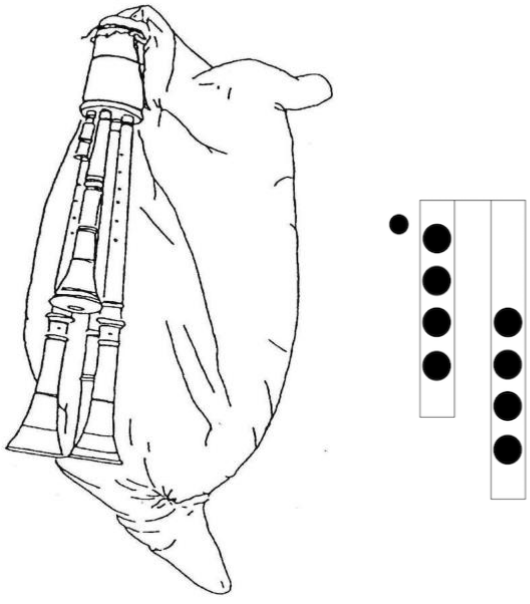


Figure 3.28 *Zampogna a paro* and position of its finger-holes

[23] The shape of the pipes is strongly influenced by the aesthetic model of the *zampogna a chiave* (La Vena 1994) described further in the thesis.

Both *surdulina* and *a paro* have chanters of the same length, a characteristic that relates them to instruments found in the eastern and southern shores of the Mediterranean Sea (Baines 1995). This hypothesis is corroborated by the history of the areas in which the two bagpipes are found.[24] Both are modal instruments: their tuning system strongly lean towards the fifth of the scale, a note present in all of the pipes with the exception of the left hand; this note also encloses the scale produced by the instruments, being the lowest and highest sound.

The *zampogna a chiave* (Figure 3.31), a derivation of the instrument developed in Napoli in the XII century (Guizzi 2002), is mostly found in the northern and in the southern part of the region, with a few exceptions in the central area. The construction technique and the scalar system it produces make it a rather modern instrument. In fact, it is built with a lathe by professional makers, whereas other bagpipes found in Calabria were mainly handmade by the pipers themselves. Furthermore, the instrument's scalar system is tonal: it leans strongly towards the tonic, which is also the lowest sound produced by this bagpipe. Its name comes from the spring-activated key placed on the left chanter. In Calabria, two types of this instrument are present: *the zampogna a chiave calabro-lucana*, in the far north of the region, and the *zampogna a chiave delle serre*, found all over the central and southern part of the region. The latter is an indigenous adaptation of the former, which, in turn, is directly derived from the *zampogna a chiave campana*. The *zampogna a chiave calabro-lucana* has two melodic chanters and two drones, all with conical bores and double reeds. The *zampogna delle serre* has been influenced by the *a paro* bagpipes, with which it shares a consistent part of its area of diffusion. It has two chanters and three drones all with double reeds, where the added lower drone has a cylindrical bore as in the *a paro*. Tunings of the two types are shown respectively in Figure 3.29 and Figure 3.30.

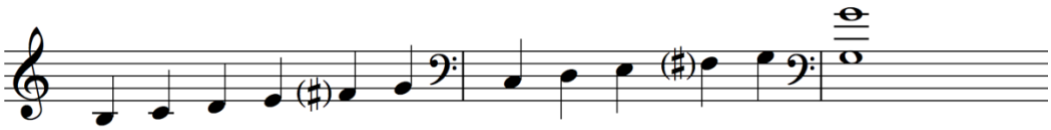


Figure 3.29 Scalar system of the *zampogna a chiave calabro-lucana*

[24] The area of the *surdulina* was influenced by the Albanian diaspora of the Fifteenth century. Pushed away by the Ottoman Turks, Albanian refugees found shelter in the norther part of the region giving birth to what today is known as Arbëreshë communities. Similarly, the area of the *zampogna a paro* is strongly influenced by the presence of Grecanic communities with their relicts of Greek and Bizantine culture (Castagna 2006).

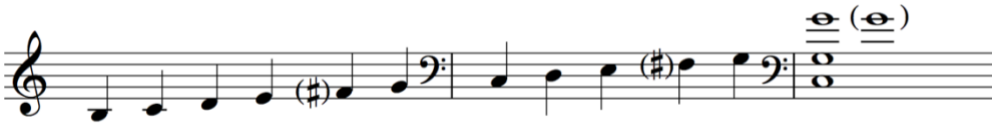


Figure 3.30 Scalar system of the *zampogna a chiave delle serre*

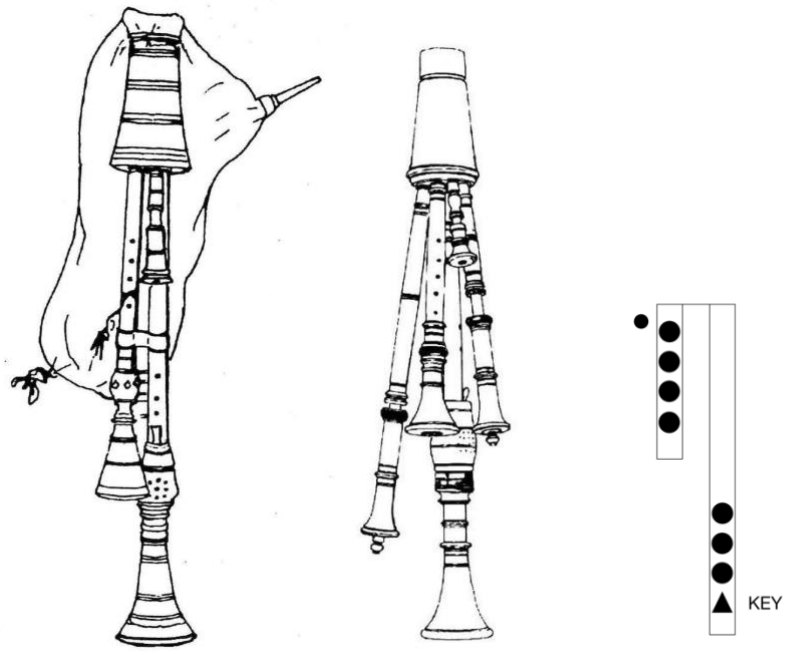


Figure 3.31 *Zampogna a chiave calabro-lucana, a chiave delle serre* and position of their finger-holes

The *zampogna a moderna,* shown in Figure 3.32, could be considered a hybridisation of the *zampogna a paro* with the model *a chiave*. It could be described as an *a paro* instrument with a longer left chanter (Guizzi 2002), or as the result of the application of the scalar system of a *zampogna a chiave* to a *zampogna a paro* (La Vena 1994). It features all single reeds, and it is found in an area that coincides with that of the single reed *a paro*. Featuring all single reeds, the key is no longer needed. The single reed, in fact, acts on the acoustic properties of a sounding pipe by shifting its tone-centre up or down. This shift has consequences on the placement of the finger-holes. Through this expedient, the left chanter of the *a moderna* bagpipe can produce the same scale of that of an *a chiave* without resorting to a key: the finger-holes are in fact closer to each other, therefore easily

reachable by the player's hand.[25] The tuning of this *zampogna* coincides with that of the *zampogna a chiave*, as shown in Figure 3.30. Both the *zampogna a chiave* and the *zampogna a moderna* are used to accompany the *ciaramella*,[26] whereas the *zampogna a paro* and the *surdulina* are mainly solo instruments, sometimes accompanied by frame drums.

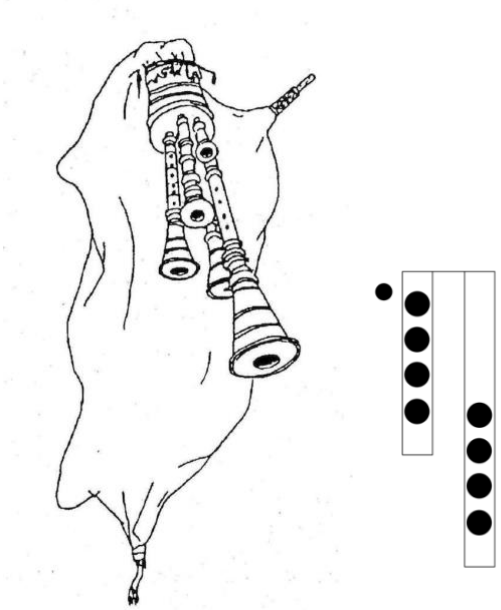


Figure 3.32 *Zampogna a moderna* and position of its finger-holes

Bagpipes in Calabria have a vast repertoire that embraces the most disparate musical ambits, from dance to processional music, from accompanying songs to functional music to grazing the flocks. The repertoire is differentiated by geographical areas, and includes an extensive variety of pieces throughout the region. Despite the differences among the repertoires, bagpipe music is based on the *modular micro-variation* principle described in Section 0. It hinges on small originating cells that are usually confined within a length of four or eight beats. The performance technique includes extensive use of *gracing*: quickly "separating and accentuating notes by grace notes executed with great speed and often over wide intervals" (Baines 1995, 19).

[25] The acoustic implications of the single reed, a fundamental concept which informed the compositions described in Section 5.3, will be discussed in the following section.

[26] The *ciaramella* is an oboe that is used to play monodic melodies.

3.4.2 Tuning process

The process of forcing the acoustic properties of a sounding pipe, described earlier for the *zampogna a moderna*, is structural to all the single-reed bagpipes in Calabria. It is mostly observable in the models featuring chanters of the same length, such as the *surdulina* and the *a paro*. In these instruments, the two chanters in fact produce different sets of pitches, although they are of the same length and have the same inner bores. This is possible because of the way single reeds function, and it is manifestly evident in the *surdulina* of the *1st and 2nd kinds*, in which the finger-holes of the two chanters are perfectly parallel – see Figure 3.26.

In a reed instrument, sound is produced by the cyclical interruption of the airstream passing through the lamella. The air passes through and creates a pressure differential that pushes the lamella down and closes the reed. The sound wave travels to the distal end of the pipe and flows back to open the reed once again. New air is then allowed to enter, and a new *interruptive cycle* is started. Double reeds offer less margin to force the interruptive cycle. Single reeds, instead, allow a great variability of the duration of their interruptive cycle: the phase in which the airflow goes through the reed (which depends mainly on the interruptive device's characteristics) can be slowed down in various ways, the simplest of which is by making the lamella heavier (La Vena 2005, 14). Thus, the weight (and therefore also the dimensions) of the lamella influences the frequency produced by single reed. Forcing the interruptive cycle of the single reed makes it possible for two pipes of the same length to produce different pitch levels. In turns, the adoption of such a device makes the intonation of these instruments quite unstable. The changes in frequency are to be counterbalanced by adjusting the dimensions of the finger-holes, especially in consideration of their parallel displacement over the two pipes. The finger-holes are normally tuned by the insertion of wax into the openings. Narrowing the diameter of the finger-holes reduces the amount of air that escapes through them and consequently lowers the tone produced.

The variation of pitch that occurs while tuning the instrument is demonstrated here through pitch, spectral and aural analysis. I recorded different phases of the preparation and tuning of my *surdulina* bagpipes and subsequently analysed the recordings with mixed methods. I conducted pitch and spectral analyses with Sonic Visualiser (Cannam, Landone, and Sandler 2010) and subsequently cross-checked the results with aural analyses that I conducted with the *31-Limit Helmholz-Ellis*

Calculator (Sabat, n.d.), an accidentals and ratios to cents additive synth for microtonal MIDI playback developed in Max MSP by composer and intonation theorist Marc Sabat. I also conducted the same analyses on various recordings of *surdulina* players.

The first readings concerned the tuning of the two drones with the highest pitch of the right-hand chanter (RC). Pipers use this note as a reference tone for tuning the drones: it is in unison with the higher drone (HD) and an octave higher than the lower drone (LD). Both drones have a telescopic segment that facilitates their tuning. The analysis reported the readings in Figure 3.33, in which I transcribe both frequency and the note produced with variation in cents. The leftmost column indicates the pipe and the finger hole that produces the note. Finger-holes are counted top to bottom.

RC	360.961Hz	F#4 -43c
HD	342.51Hz	F4 -34c
LD	173.959Hz	F3 -7c

Figure 3.33 Readings of the untuned drones

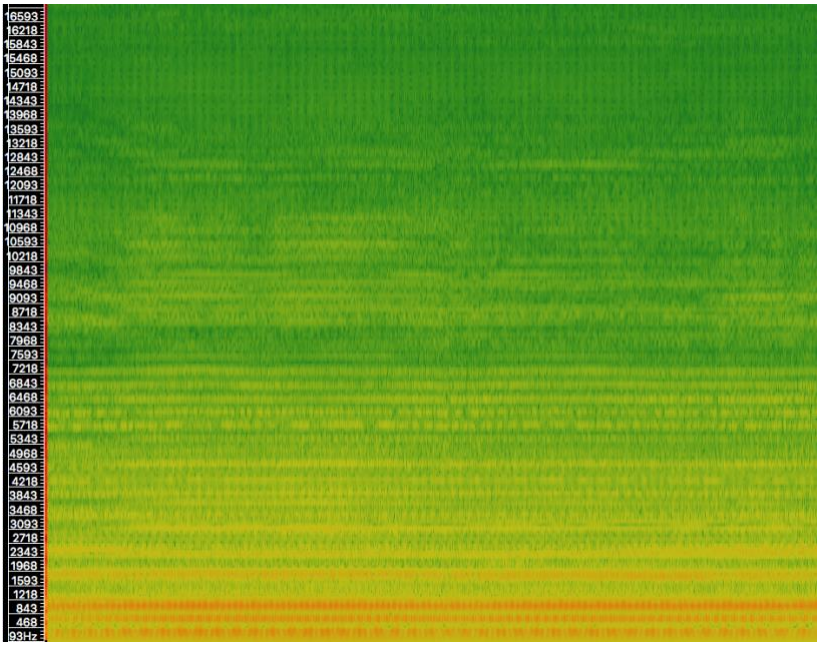


Figure 3.34 Sonic Visualiser spectrogram of the untuned drones

After tuning the two drones with the reference note, analysis returned the readings transcribed in Figure 3.35:

RC, HD	360.961Hz	F#4 -43c
LD	180.521Hz	F#3 -42c

Figure 3.35 Readings of the tuned drones

I subsequently analysed the sounds produced by each single finger hole completely clear of wax; therefore, the sounds produced are at the upper limit of detuning possible for each hole. The readings, reported from high to low, are shown in Figure 3.36 and Figure 3.37. It is worth noting that the drones are slightly higher than what was reported in the previous readings: this is due to the temperature, which rises when playing the instrument, thus affecting the airspeed and consequently the pitch.

HD/RC	364.244Hz	F#4 -27c
RC1	329.681Hz	E4
RC2	305.798Hz	D#4 -30c
RC3	279.547Hz	C#4 +15c
LC	270.716Hz	C#4 -41c
RC4	252.941Hz	B3 +42c
LC1	246.094Hz	B3 -6c
LC2	234.079Hz	A#3 +7
LD	182.168Hz	F#3 -27

Figure 3.36 Readings of the untuned bagpipes

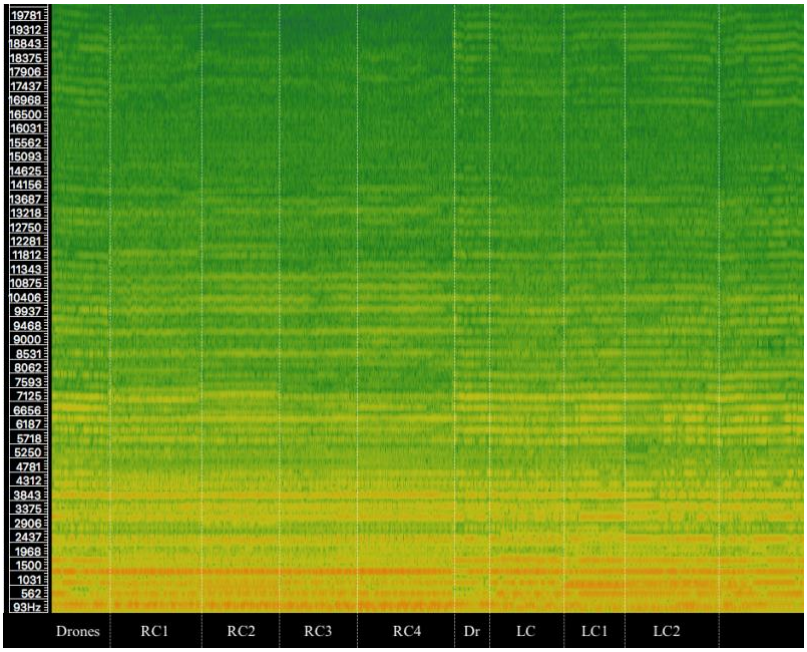


Figure 3.37 Sonic Visualiser spectrogram of the untuned bagpipe

I conducted new readings on the fully tuned bagpipe, after the progressive application of wax to the finger-holes of the two chanters. This time, I had played the bagpipe for a long time and temperature had risen more. The readings are reported in Figure 3.38.

HD	370.009Hz	F#4
RC1	323.757Hz	E4 -31c
RC2	308.231Hz	D#4 -16c
RC3, LC1	278.039Hz	C#4 +5c
RC4, LC2	246.873Hz	B3
LC3	232.000Hz	A#3 -8c
LD	185.042Hz	F#3

Figure 3.38 Readings of the tuned bagpipe

The range of the instrument, within one octave, together with the simultaneous and uninterrupted sound production of the four pipes, produce a very rich spectrum that poses issues when using computer-based analysis. In order to have more precise readings, I cross-checked the spectral and pitch analyses of the fully tuned bagpipe with aural analyses that I conducted with the aid of the *31-Limit Helmholtz–Ellis Calculator*. This tool allows custom pitches to be assigned to every key of a virtual or physical midi keyboard. These pitches can be assigned pre-set deviations – such as syntonic comma, Pythagorean comma etc. – as well as custom assignments calculated both by cents deviation and frequency. The analysis method aimed to minimise the beating between the sounds produced by the synthesiser and those of the recording. It aimed at reproducing the harmonic fusion of the bagpipe on the computer-based instrument. I analysed my bagpipe and the recordings published in (La Vena 2005) and (La Vena 2003). As a first step, I matched the synthesiser with the bagpipes' two drones, for they are the lowest and highest pitch produced. I then matched the synthesiser with RC4 and RC3 – and the corresponding LC1 and LC2 – which are a 5^{th} away from the drone. Then followed the tuning of RC3 – the 3^{rd} – and finally RC1 and LC3 – the 7^{th} and 4^{th}. These cross-check analyses confirmed and perfected the readings obtained through *Sonic Visualiser*.

Although not consistent with all the recordings in my archive and in La Vena's works, the analyses show the predominant tuning system adopted by most players. Figure 3.39 is a snapshot of the pitch analyses of a *sunata* by Agostino Troiano published in La Vena (2002), track 1. Figure 3.40 shows the readings obtained

through the aural evaluations I conducted with the *31-Limit Helmholtz–Ellis Calculator*.

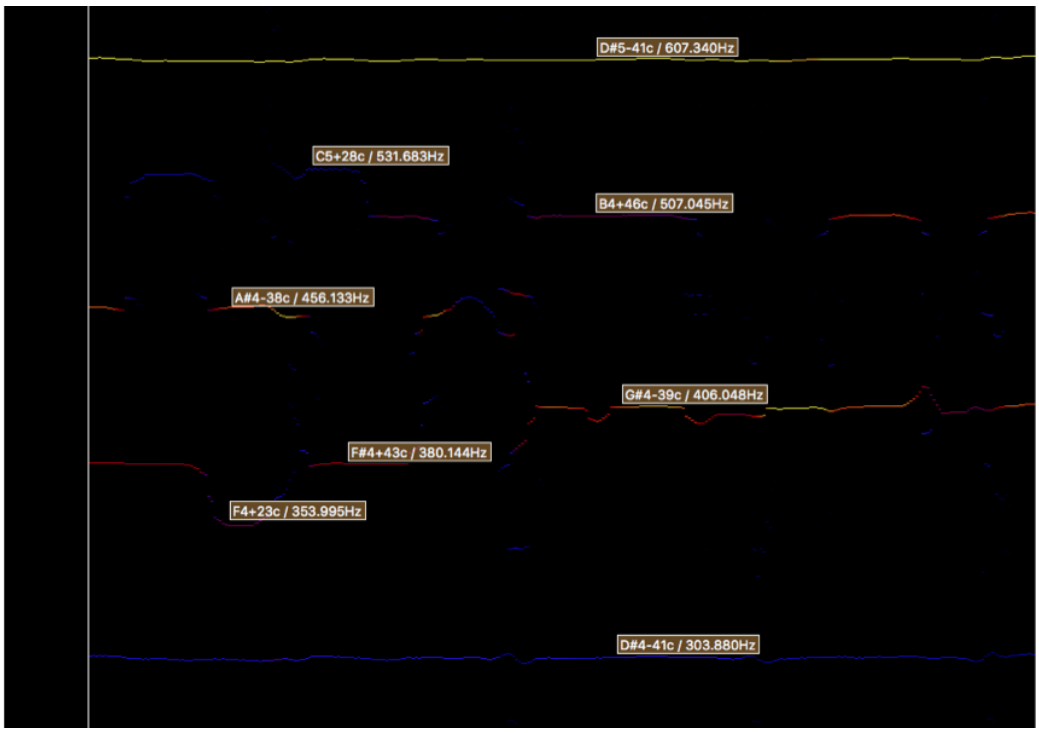


Figure 3.39 Sonic Visualiser snapshot of Agostino Troiano's *sunata*

HD	608.041Hz	D#5 -40c
RC1	531.782Hz	C5 +28c
RC2	507.182Hz	B4 +46c
RC3, LC1	456.043Hz	A#4 -38c
RC4, LC2	405.584Hz	G#4 -41c
LC3	379.957Hz	F#4 +46c
LC4	354.717Hz	F4 +27c
LD	304.020Hz	D#4 -40c

Figure 3.40 *31-Limit Helmholtz–Ellis Calculator* readings of Agostino Troiano's tuning

The tuning system appears to be derived from the harmonic series of the rest-note RC4. I show the harmonic relationships of all sounds with the rest-note in Figure 3.41. I use the *Helmholtz–Ellis Just Intonation Pitch Notation* devised by composer Marc Sabat (2009). In this notation, all accidentals refer to a pitch deviation from Pythagorean fifths (pure fifths).

Stands for a syntonic comma deviation from a Pythagorean 5th: it refers to the pure 3rd (harmonic n. 5 of the overtone series).

Stands for a septimal comma deviation from a Pythagorean 5th: it refers to harmonic n. 7 of the overtone series.

Having *c* as a tone-centre, the analysis shows that the tuning is based on harmonics n. 1, 3, 5, 7, 9, 15, and 21.

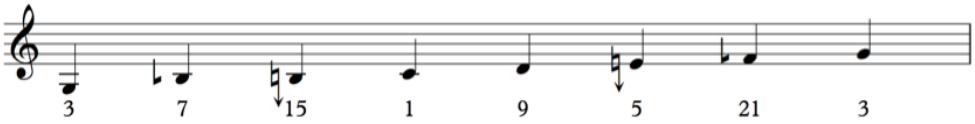


Figure 3.41 Just intonation transcription of the *surdulina*'s tuning system

However, the *surdulina*, as a consequence of its modal setting, has two harmonic centres of attraction: the rest-note and the drones. Thus, the tuning system can be interpreted as being derived from these two harmonic centres of attraction of the bagpipe. In fact, harmonic n. 15 of *c* is the pure 3rd of the 5th *g*. For the same principle, harmonic n. 21 of *c* is the harmonic 7th of *g*; and harmonic 9 of *c* is the Pythagorean 5th of *g*. I interpret this system as being based on simple harmonic ratios of the two centres of attraction *c* and *g* in Figure 3.42. The black notes sit on the harmonic series of the rest-note; the blue ones sit on the harmonic series of the drones. This interpretation shows a tuning system constructed through the superimposition of the odd partials 1-3-5-7 of two harmonic series a 5th apart.

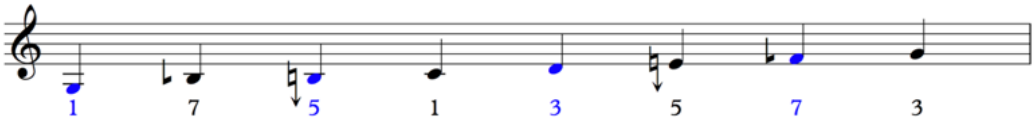


Figure 3.42 Interpretation of the tuning system in relation to the rest-note and the drones

Marc Sabat and Robin Hayward (2006) define as *fusion* the "perceptible periodicity" of a harmonic interval, the point where beatings are no longer heard and the interval is perceived as a focused unity. Pipers seem to gain empirical knowledge of the *fusion* effect of the desired intervals. The tuning process is acquired by imitation through a long training period during which the piper gains empirical knowledge of the tuning system and of the technical aspects of the instrument.

Choosing reeds and tuning the bagpipe is a time-consuming task that involves a specialised set of knowledge as well as highly developed practical and aural skills which are normally acquired by the experienced piper through a long empirical

training period. These skills are often acquired through the use of propaedeutic instruments such as the cane double clarinet, a simple, self-made instrument that reproduces in small scale the physics, acoustics and fingering of the bagpipe.

Temperature and humidity have a decisive role in the tuning of the instrument, which thus has to be perfected at the beginning of each performance. Humidity infiltrates the reed's fibres, thus making the lamella heavier; temperature influences the airspeed in the pipes, thus affecting the tuning. The instrument needs to be activated for a certain time before it can properly and steadily play in tune. This time-consuming task becomes an integral part of the piper's repertoire, although it is not considered a proper musical activity. The importance of a perfectly tuned instrument emerged in the observations: many players refuse to play music until they are completely satisfied with the tuning. This could also mean making the dancers wait for many minutes – sometimes over half an hour – until the piper is completely satisfied and ready to play.

3.4.3 Tuning as a musical activity

Tuning bagpipes is not merely a functional activity. It is indeed a culturally defined process that is strictly pertinent to the realm of music. Although being considered neither a musical activity per se nor part of a performance, it involves very refined technical expertise as well as sophisticated aural and musical skills. Tuning is an essential part of the musical assets of a piper. The cultural component of tuning is especially evident when comparing the approaches adopted in different areas of the region. Besides the choice of timbre for bagpipes belonging to different families, observations brought to light various approaches to sound, which are differentiated according to cultural and geographical areas, even for bagpipes belonging to the same type. The choice of tone-centre is one of the most evident factors in such a differentiation. In an area culturally oriented towards a low tone-centre – such as the area of the *conflentana* – it is common to find small instruments whose acoustical properties are drastically forced through the expedients described in the preceding paragraph. For instance, Natale Rotella's *conflentana* bagpipe, whose chanters' length is 34 cm, is tuned in D#2, much lower than *conflentane* with chanter length between 40 and 50 cm and whose tuning ranges between F#2 and A#2 (La Vena 2005, 142). If the process of forcing the tuning reveals a culturally informed preference for a lower tone-centre, the procedures adopted to achieve it

also reveal culturally defined processes. In fact, a goal that could be easily achieved by building longer pipes is sought regardless of the dimensions of the instrument. Matter and acoustics are forced by a culturally informed process in the search for an equally culturally informed idea of sound. Pipers look for a specific timbre and a peculiar balance among the sounds produced by the instrument that are not achievable by building longer instruments. In fact, forcing the ideal tone-centre affects the tuning of the finger-holes, which must be narrowed progressively towards the distal end of the pipe with beeswax. Narrow holes let less air escape the pipe, resulting in quieter pitches. Through this procedure, the higher notes of the bagpipe are louder while the lower are progressively fainter. Consequently, pipers achieve a specific (im-)balance in the acoustics of the instrument that responds to cultural needs. The repertoire played on these instruments revolves around this imbalance between high and low registers.

Cultural differences also emerge in the actual procedures adopted for tuning the bagpipes. The cultural component of the tuning process is especially manifest in the pitch relationships that pipers chose as a sonic reference for fine tuning. In fact, tuning is achieved through the aural evaluation of the harmonic (intervallic) relationships between the pitches produced by the instrument. Pipers tune their instrument through bichords, trichords and tetrachords. Observations brought to light geographically defined differences in the choice of these intervallic relationships, almost as if there were culturally differentiated (musical) repertoires of tuning processes. For example, in the two defining areas of the *conflentana* and the *surdulina of the 2nd kind*, the starting point and constant reference throughout the whole tuning process are, respectively, the higher and lower drones. Pipers mute the left-hand chanter, and the low or high drone, depending on the area to which they belong, using the other drone as a reference.

If we consider music as “humanly organised sound” (Blacking 1974), we can include this highly specialised, standardised and culturally defined repertoire of techniques as fully pertaining to the realm of music. In fact, considering the high level of organisation, the outstanding refined aural skills and the cultural differentiation of the processes involved, it appears evident that tuning these bagpipes requires very sophisticated musical abilities. Although not properly considered as music, in the sense that the word has in Western high culture, this process is entirely pertinent to the Calabrian musical realm. In such a perspective, the tuning process could be depicted as a repertoire of music which, in turn, is

functional to other musical activities. In such a repertoire, the saturation of the harmonic space, resulting from aggregates of notes in the non-rationalised harmonic system produced by the tones of a not-yet-tuned bagpipe, is slowly pushed towards a rationalised organisation through the tuning process. This process has a clear direction which could be depicted as an arrow that moves from an unorganised to a rationalised harmonic space. During this path, the ear experiences the slow-moving changes in the harmonic space and the different, non-quantised, interval relationships between pitches. In Calabrian bagpipes, tuned with natural harmonic ratios, this progress towards rationalisation could be translated as moving towards the simplification of the mathematical relationships between pitches.

The concepts discussed in these pages were explored creatively in a series of compositions included in this thesis and discussed in Section 5.3. The tuning process, in which an unrationalised harmonic space is pushed towards rationalisation, is explored in *No Dance Otherwise, Into the Pipe* and *Alla Berlinota* through different techniques. The tuning system based on simple harmonic ratios, microtonally deviating from a tempered scale, informed *Alla Berlinota*, a Just Intonation piece that explores the harmonic relationships and ratios produced by the *surdulina* bagpipes.

3.5 Animal bells

The primacy of hearing over sight in oral cultures, and in pre-Renaissance Europe, has been maintained by scholars from different disciplines. For instance, historian Aron Gurevich (1985) describes an ear-based perception of time in the Middle Ages. Murray Schaefer (1994) talks about the predominance of sight in modern societies as opposed to hearing in traditional or ancient cultures. Vincenzo Caporaletti (2005), drawing on Marshall McLuhan's (1994) theory of media, identifies the origin of the cultural-perceptual shift from aural to visual in the development of printing at the dawn of the Modern era.

During the past decades, sound has also become more and more a matter of study on its own. John Cage's focus on sound has exerted a strong influence on both contemporary musicology and composition. John Blacking (1974) offered a definition of music in the light of the increasing studies on musical cultures around the world, and in relationship to Cage's innovations in Western music. The famous

definition advanced saw music as “humanly organised sound”. Sound itself acquired increasing importance in musical studies, also as a consequence of the emerging research on cultures where the concept of music is absent. For anthropologists and ethnomusicologists, the study of sound became a way to understand human civilisations: in those perspectives, sound is studied as a cultural artefact that bears signification in relation to the culture that produced it. Therefore, composers, musicologists, ethnomusicologists, anthropologists, and historians started to approach sound as a primary object of study: examples include composer R. Murray Schafer’s (1994) influential concept of soundscape, as well as approaches to sound studies such as anthropology of sound (Feld and Brenneis 2004), acoustemology (Feld 2015), anthropology of listening (Ricci 2016, Porcello et al 2010), and Eco-Muse-Ecology (Feld 1994) and sensory history. According to these scholars, sound shapes our world (Schafer 1994), as well as our perception and understanding of it (Feld 1984; Feld 2015).

By referring directly to the object that produces it, sound affirms a principle of existence: the sound testifies for the object’s presence in the world. At the same time, the immateriality of its sound enables a symbolic representation that transcends the object (Ricci 2012). Bells are a rather clear example of this power of symbolisation: they relate to the divine or the otherworldly in cultural communities worldwide, from Buddhist temples to Christian churches. Aron Gurevich (1985) maintains that bells were the sonic device on which the perception of time relied during the Middle Ages: different bell-tolls throughout the day regulated the temporal arrangements of the daily life of Medieval people.[27] Studies reveal that animal bells retain these symbolic meanings too. Steven Feld extensively researched the way bells, including animal bells, shape the perception of space. This power of symbolic representation also emerges in Antonello Ricci’s research on animal bells in Lazio and Calabria (Ricci 1996; 2004; 2012; 2016). Ricci’s studies, conducted from a perspective of the anthropology of sound, are also the most detailed to date concerning the use of animal bells in Calabria. The symbolic value of animal bells is manifest in the many apotropaic rituals, in which they play a central role. Animal bells are used in Greek carnivals (Panopoulos 2003), in the Sardinian ritual of the Mamuthones (Turchi 2011), and in propitiatory winter rituals in Basilicata

[27] The relationship between the sound of bells and the passing of time is also testified by the etymology of ‘clock’. In fact, the name of the time-measuring device is derived from the Middle Dutch ‘clocke’ or the Old French ‘cloque’, both meaning ‘bell’; an etymology that is also shared with ‘glocke’, the modern German term for ‘bell’.

(Scaldaferri 2005; 2009). Symbolic connotations are also manifest in the way animal bells are used to “garnish” the flocks: the sounds produced by the bells are infused with connotations that refer to animals’ species, gender, age, social rank, and personality.

In the following sections, I describe the outcomes of my research on animal bells in Calabria. At first, I describe the types of bells used in the region and their construction method. Afterwards, I discuss their functional use and describe their symbolic signification. I then discuss the refined musical skills involved in tuning and garnishing the flocks and describe the bells’ aesthetic value.

3.5.1 Calabrian types of animal bells

Two main types of animal bells used in Calabria emerged in my research. Rocco Greco, bell-maker from Figline Vigliaturo, describes them as *campane* and *leccisi.* They differ mainly in the shape and consequently in the tonal character.

Campane have a narrow body and a pronounced elliptical opening. Figure 3.43 shows the sides and plane projections of a *campana*. The body is narrow and widens slightly at the bottom.[28]

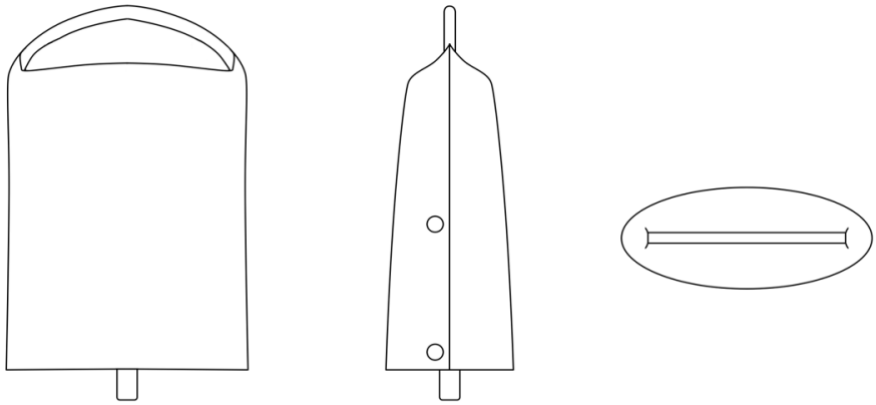


Figure 3.43 Campana

Leccisi are often referred to as “round bells”. They, in fact, have a wider body, a more pronounced curve at the “shoulders” and at the bell opening. Figure 3.44 shows the sides and plane projections of a *leccise*. The more pronounced roundness of the body usually produces a lower sounding pitch compared to a

[28] It is somewhat different to alpine cowbells, which have wide shoulders and a narrower opening.

campana of the same dimensions. Furthermore, *leccisi* have a more resounding toll and a longer decay.

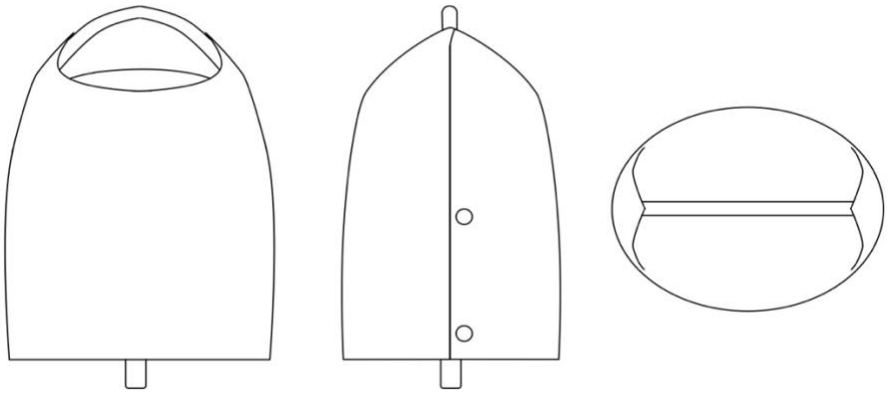


Figure 3.44 Leccise

Both instruments are made out of a sheet of metal that is cut, hammered and curved into shape. After hammering the metal, the margins of the sheet overlay at the two narrow sides of the bell, where they are held together by rivets. Rocco distinguishes the bells by their dimensions and by the number of rivets he puts on each side, from one to three; different numbers of rivets also confer the bell with different sound characteristics. The handle is obtained from a rod of metal that is placed at the top and runs along the bell's wide side; it reaches the inside of the bell forming an ellipse from which the inner beater hangs. At the end of the shaping process, different metal powders are added to the bells in order to achieve the desired alloy. They are subsequently encapsulated in a cast of clay and fired in a furnace. Afterwards, they are quenched; different quenching methods result in different sound qualities, as they "soften" or "harden" the metal. At the very end, the beater is added, and the bell is ready to be tuned. The beater is made of a metal rod hooked to the inner part of the handle and whose length reaches over the opening of the bell: sound is produced when it strikes against the inner edge of the opening. At the end of the process, the bells are tuned by hammering narrow spots of the body near the opening.

3.5.2 Bells' function and symbolism

Bells are functional devices used to identify and keep track of the animals in a flock during grazing. They enable a representation of space that helps shepherds to track their animals across the pasture. In Calabria, three types of animals are mainly farmed: cattle, sheep and goats. Each species is assigned a different set of bells in accordance with their specific social behaviour.

Sheep are mostly gregarious animals. As they tend to cluster, they are given only two sounds. A low-sounding bell is assigned to the male, whereas the females are assigned bells that all produce the same, slightly higher pitch. Sheep recognise each other as alike and are driven together by the sound of their bells.

Cattle have more complex societies as they are organised in family clans each ruled by the oldest female. Furthermore, they have two different sets of bells: one for grazing and one for transhumance. For grazing, the dominant animal of each clan is given a bell, so that every clan is assigned a different pitch. The members of a family identify themselves with the peculiar sound of the dominant female of their clan and are driven together by it. For the transhumance, the cattle receive a different set of much heavier bells that produce lower pitches.[29] As she usually leads the group and opens the way, the oldest female of the whole herd receives the lowest pitched instrument. Her bell is the most resounding and it is audible at a great distance. Other high-ranking cows are also assigned a bell during transhumance: in line with the rest of the cattle, they function as signals for the animals that follow. The interviewees attributed tremendous power to the sound of transhumance bells: Rocco affirms that when the cows hear the big bell, they start to line up and get ready for the migration, even out of season.

According to the interviewees, goats have the most complex personalities among herd animals. Shepherds also hold them in higher regard than sheep because of their intelligence and independence. Indeed, they show more complex social behaviours and more unpredictable personalities compared to cattle and sheep. Bells are distributed according to social rank, gender, social behaviour and individual personality. The dominant male is assigned the lowest sounding bell of the whole flock, which is also referred to as a "male sound". A consistent part of the flock has gregarious behaviours: similarly to sheep, these animals are assigned

[29] Grazing bells weigh between 1 and 2 kilograms; transhumance bells weigh from 2.5 to 5, or sometimes 6, kilograms.

bells that all produce the same pitch. Other members of the flock are assigned different tones according to their behaviour and personality. An animal that usually walks ahead of the flock is assigned a distinctive sound that uniquely identifies it; so is an animal that usually walks behind the flock. This way, when these two pitches are heard together with the bells of the gregarious animals, shepherds are aware of the position of most of their flock. Other animals have distinctive bells also chosen in accordance to their personalities: usually animals that show an independent attitude, or animals that usually "misbehave" are assigned characteristic bell-sounds so that they can be tracked more easily across the pasture.

Shepherds carefully tune their flocks so that the sound they produce is unique and therefore recognisable even at a distance. They must aurally distinguish theirs from a different flock that might be in the neighbourhood. Shepherds have incredibly refined hearing skills and can recognise their herd, and single out specific animals, even when two flocks cross each other or mingle.

The perception and the cognitive representation of space, enabled by sound, is embedded in the human hearing system. The detection of *Interaural Level Difference* – the difference of intensity at which a sound reaches the two ears – and *Interaural Time Difference* – the temporal difference at which a sound reaches the two ears – specify the location of a sound source to the listener (Moore 2013). The perception of position and distance is given by the combination of different factors such as the difference in the arrival time at the two ears, a phase difference in the reception of the signal, spectral properties and the intensity of the sound. Echo and reverberation are also important clues for deciphering the size and the shape of the space in which listeners are situated (Clarke 2013).

Shepherds seem to be aware of all these factors, as becomes apparent in conversations and interviews: their words translate the mentioned principles in a terminology that shows an empirical understanding of the acoustic phenomena involved. Rocco Greco highlights how bells enable a powerful and detailed representation of space. On many occasions, he stresses how shepherds are guided by the bell's sound to retrieve a lost animal. Rocco also highlights how sound communicates not only the position of the animal in space but also delivers information about its state. From the way sound is reflected and reverberated by the environment, shepherds can identify if the animal is in a plane, on a ridge or in a ravine. Furthermore, from the way its bell tolls, they are able to understand if the animal is grazing, resting, walking or is stuck in a ditch. Antonello Ricci (2016)

describes an episode that he witnessed while conducting research. The shepherd with whom he was travelling had lost an animal. Ricci describes a ride through the woods at night, interrupted by short breaks during which the shepherd attentively listened to the environment to decide which direction to go. The shepherd was able to identify the position and eventually retrieve his lost animal only by following the sound of its bell.

Steven Feld (2015) maintains that sound is charged with symbolic meaning and enables complex relationships among humans, non-humans and space. Animal bells are associated with different levels of symbolic signification and are a vehicle for establishing a complex network of relationships. Bells are carefully chosen so to match the animals that will wear them. Lower pitches are usually charged with male connotations and therefore assigned to male animals. Higher pitches are associated with female characters and consequently attributed to female animals. Lambs and kids often receive the smallest bells that produce the highest pitch in the flock. As described earlier, sounds are also symbolically associated with the personality and social behaviour of the animals so that shepherds can recognise specific animals by their respective bells and can keep track of their flock. This way, a relational network is established between humans and animals.

Flocks shape the soundscape (Schafer 1994) of valleys, rivers and villages, thus establishing relationships with space. They shape the geography of a community and its spatial representation. In other words, the sound of bells anthropises the landscape.

Sound also initiates relationships among animals. In the absence of a visual reference, cows identify their clan with the leading animal's bell, whose sound drives them together. Similarly, the gregarious members of sheep and goat flocks are driven together by their same-pitched bells. Because the animals tend to identify themselves with the sound they are wearing, some shepherds let them choose their bells: they ring various bells and eventually assign an animal the one whose sound attracts it the most (Ricci 2012). Bells, in fact, become a significant factor in the animal's representation of self.

Sound also enables the representation of identity for humans, and the sound of their flock is a substantial identity factor for the shepherds' families. Each family identifies itself with a specific sound. In Luigi Nigro's tales, his attempts to imitate the sound of his grandfather's flock is described as a way to foster the family's identity (Ricci 2016). Bells are a precious part of the family inheritance, and they are often

passed on to the firstborn male. Losing bells or having them stolen is considered a tremendous disgrace: having their sound stolen means losing a symbol of the family's identity (Ricci 1996; Panopoulos 2003).

The sound of the bells also establishes cultural relationships; it has a strong evocative power which can be described with two examples. In a video included in Antonello Ricci's (2016) book, the shepherd Luigi Nigro describes an episode that occurred while he was leading his flock across the woods at night. When he arrived close to a road, he noticed a man in tears inside a car. He learned then that the man had stopped his car in the darkness to contemplate the sound of Luigi's flock. The man was so moved by the event that he told everybody in the neighbouring towns about the beauty of the sound of Luigi's flock. I recorded a similar emotional relationship with the sound of bells during a conversation with the relatives of a shepherd from Settimo Cosentino who passed away a few years ago. The son tells that his father had to give up the animals because of health problems: in the last ten years of his life, the man's health did not allow him to undertake the strain of putting the goats to graze. His father had sold all the animals but had kept all the more than a hundred bells with their associated carved wooden collars. During my visit, the collars where still hanging from wooden beams, where the man had stored them after having sold the animals. The old shepherd would occasionally hide in the attic and shake the poles from which the bells were hanging for up to half an hour. The son tells how this sort of personal ritual would lift his father's spirit and relieve his melancholy for not being able to spend time anymore in the open air with his animals. His healthy past spent in the fields was thus evoked in such a ritual by the sound of his flock's bells.

Animal bells are also charged with spiritual symbolism: some shepherds put the bells on their animals at Easter. During Holy Week, from the night of Holy Thursday until Easter morning, church bells are not rung in most Calabrian towns. In those days, the liveliness of the bells is replaced with grave wooden sounds, which represent death. For three days, the calls to Mass are made by young men and children wandering around the town with wooden and metallic shakers – called *trocche* or *troccole* – that produce a loud and creepy clank. On Easter morning, the resounding tolls of the church bells are heard again to symbolise and celebrate the

resurrection of Christ. On the same day, some shepherds prepare their flocks for the transhumance and garnish their animals with bells.[30]

Bells are not considered to be musical instruments in Calabria, but rather sounding objects. Nevertheless, they involve highly specialised skills and hold very refined aesthetic value that can be associated with musical behaviours. The aesthetic component of bells is very important both for shepherds and for people who happen to hear the sound of a flock. Shepherds choose carefully before purchasing their bells. They look for purity and clearness of sound: they avoid disturbing overtone collisions, the sound of which is described with the verb *grastiare* (possibly translatable as “to scratch”). After purchase, they carefully tune the bells in search of a sound that is both personal – therefore distinguishable from that of other shepherds – and pleasurable. The tuning is achieved by putting the bell on an anvil and hammering the bell’s walls: the closer to the bell’s opening, the lower is the pitch obtained. Although being a rather rough technique, shepherds are able to tune their bells with extreme precision. They perceive their flock as producing a single sound, a harmony that has to be beautiful. The sound of a flock is also an object of appreciation and comments within the community: a well-tuned herd is often appreciated for its beauty. Sometimes, shepherds tune their flock in accordance with their bagpipes, which they often play along during grazing (Ricci 2012). Observations in Sila, the mountain plateau in Central Calabria, delineate a complex soundscape where the vast grazing lands, bordering one another, are imbued by the sound of different herds of cattle. By hiking in the mountains, one can easily have a sense of the differentiation of harmonies that, coming from various sources, shape valleys, peaks and plains.

The research described here, especially concerning the use of bells in goat flocks, informed the composition of a piece of mine that will be discussed in Section 5.4. *All’Erva Radicchia* explores the complex harmonies produced by goat bells and the indeterminate behaviour and the representation of space enabled by the sound of the animals moving through the landscape.

[30] Bells are often put away during winter since the pasture is confined to a smaller field which is usually closer to the shepherd’s home.

3.6 Summary

This chapter described the studies carried out on Calabrian music and discussed the data that emerged in that enquiry. The research focused on three main areas of Calabrian folk music: generative principles, tuning, and animal bells.

The study of generative principles brought to light a creative process based on the perpetual iteration and variation of small and stereotyped musical elements. This process relies on the use of limited musical resources that I defined as *economy of means*. Calabrian musicians sequence, recombine and variate short musical cells in real time. Musicians store these cells in their memory either as finite melodies or as formulaic principles that they actualise during performance. In acquiring the repertoire, musicians adapt the musical materials to their own aesthetic taste and musical skills, so that the resulting music bears their peculiar signature.

The investigation of bagpipes' tuning revealed a process that requires exceptionally refined musical and aural skills. Through the tuning process, pipers push a disordered harmonic space towards order and rationalisation. I studied the meticulous tuning refinements as a fundamental repertoire of the pipers, and consequently as an integral part of the Calabrian musical realm. I described this process as a musical repertoire because of the highly specialised musical skills involved and because of the cultural component embedded in the task. The analysis also revealed a tuning system based on simple ratios derived from the harmonic series of the tone-centre of the bagpipe and its drones.

The study of Calabrian soundscapes and animal bells revealed an approach to sound that is highly formalised both in technical and symbolic terms. Animal bells are used as functional devices for keeping track of the livestock during grazing. At the same time, they are charged with a symbolic meaning that reveals a highly structured, culturally oriented approach to sound.

The ethnomusicological research described here provided data that became the fulcrum of the compositions that I will discuss in following chapters. Variation and extemporisation were central topics in the creative research. I translated and integrated those processes in my practice as a composer and an improviser. Mostly, I explored those processes in *Bad Habits* and *High and Subtle*. The former, described in Section 5.1, explores *economy of means* and *micro-variation* within improvisation for solo instrument. The latter, described in Section 5.2, explores the repetition and variation of a small musical cell in structured composition.

The investigations of bagpipe tuning set the theoretical and methodological framework for the composition of pieces for string quartet and for saxophone quartet. The motion from a disordered to an ordered harmonic space became the core principle which informed the compositions described in Section 5.3. *No dance Otherwise* studies this process in an uninterrupted sonic environment. *Into the Pipe* explores the harmonic movements in the context of ensemble improvisation. *Alla Berlinota* investigates both the shifting harmonic space and the microtonal tuning of the bagpipes in a Just Intonation composition.

The concept of sound as a bearer of meaning was central in the composition of a piece for animal bells. The evocative power of bells and the soundscapes they shape served as a conceptual framework for the composition of *All'Erva Radicchia* which I will describe in detail in Section 5.4. For the highly specialised skills involved and their power of evoking and shaping the landscape, I approached animal bells as musical instruments and used them in a piece of spatial music for 6 to 23 Calabrian goat bells.

Before discussing these works, I will describe the theoretical framework and methodology that guided the creative process, define the musical context for the composition outcomes, and explain the approach to improvisation and composition that guided the creative enquiry.

Chapter 4
The creative process

In Chapter 2, I discussed the methodology I adopted for my enquiry into the fundamental features of Calabrian folk music, the results of which were presented and analysed in Chapter 3. In discussing my research methods, I pointed out how a thorough understanding of folk music must go beyond the surface of the phenomena and investigate deeply into the culture that produces it, in order to understand the fundamental processes upon which that music is based. I firmly believe that the creative use of folk music elements in contemporary music practice must be as rigorous and thorough as the enquiry into folk music. Consequently, the creative enquiry abided by a well-defined research framework, which is described in this chapter. Here, I provide a methodological framework for the practice-led research, examine the sources that informed my creative enquiry, and define the context of the music produced during the doctoral years.

I conducted research through practice by drawing on my experience as a composer and improviser. The first section, discussing practice-led research methods, briefly describes the research strategies adopted and the composition methods utilised throughout the process.

In the second section, I relate my use of folk music materials to the work of other practitioners, to define the conceptual and methodological framework in which I conducted my creative investigations. I discuss Béla Bartók's methodological recommendations and relate them to the world of post-Cagean composition, to identify a possible contemporary approach to the use of folk materials.

The third part examines sources and context for the composition outputs. I acknowledge the many sources on which I have drawn for the practice-led research: these embrace many different musical realms and genres, spanning from popular to contemporary art music, from jazz to free improvisation. The aim of this third part is to provide a context and to place my music in a continuum with other researchers. In consideration of the variety of sources that informed this research, I also propose a positive and encompassing definition of "contemporary music" derived from Italian philosopher Giorgio Agamben's discourse on the 'contemporary'.

The fourth part examines the use of improvisation, indeterminacy and other real-time strategies in the music I produced. In this section, I relate my work to a legacy of practitioners who have adopted strategies embracing active performer input in their work. This discourse aims at defining a context for the creative application of the concepts of variation discussed in Section 3.3.

4.1 Practice-led research

As each new composition provided new challenges to be dealt with, my research required the adoption of different methods of enquiry, each specific to the questions and challenges posed by the problems I was facing at that time (Schön 2008). In practice-led research, "the research strategy is carried out through practice, using predominantly methodologies and specific methods familiar to […] practitioners" (Gray 1996, 3). In musical composition, and particularly in contemporary music, methodologies and methods are the most disparate and span from "scientific" approaches to the most aleatoric, from strictly musical strategies to others borrowed from different disciplines (Gottschalk 2016). In this research, I relied on my own experience as a composer and a performer, thus building on knowledge and methods consolidated during my professional career (Schön 2008). Practice-led research recognises reflection *in* practice as the main research activity, along with reflection *on* practice. Carole Gray asserts that:

> With regard to epistemological issues the practitioner is the researcher; from this informed perspective, they identify researchable problems raised in practice, and respond through practice (Gray 1996, 13).

The practitioner/researcher's role is multifaceted: generator of research material, participant in the creative process and, at the same time self-observer. The enquiry is carried out through *reflective practice*, which is a research methodology that can externalise some aspects of a creative practice, thus making explicit the implicit knowledge and expertise that practitioners hold, as well as their process of decision making (Seevinck 2013, 494). "Because [the practitioner's] experimenting is a kind of action, implementation is built into his [sic] inquiry" (Schön 2008, 85). Throughout the research, I moved from a consolidated practice as mainly a jazz composer and performer towards the composition of music for contemporary classically trained musicians. The challenges posed by my own research – including stepping into a

musical practice that was relatively new to me – required me also to develop new skills and expand my horizons as a practitioner.

Sometimes researchers/practitioners are “observers of other practitioners in order to place the research in context, and gain new perspectives” (Gray 1996, 13). It is an established practice for composers to draw from or study the work of their colleagues. During my research, I drew considerably on the analysis of contemporary music scores and the study of consolidated composition methods. Analytical writings, composition treatises, and musicians’ self-reflections or theoretical works also contributed to overcoming problems and identifying new strategies for the research. Music-analytical writings shed light on technical and formal problems related to composition and often become resources for composition themselves. For instance, pitch class theory (Babbitt 1960; Forte 1973), intended as an analytical tool, became a method for generating new music. This generative and creative approach to analytical writings played an essential role in the creation of new composition strategies throughout the research.

Part of this research was developed through instrumental practice. The pieces for saxophones – *Into the Pipe* and most of all *Bad Habits, Nine Pieces for Saxophone Solo* – required a thorough enquiry into saxophone playing techniques. This involved both the study of the available literature on consolidated extended techniques and the development of new playing techniques which responded to the specific research problems at hand. The development of new techniques required a considerable amount of experimentation with breathing, blowing, embouchure and non-conventional fingerings. I proceeded by trial-and-error with a self-reflective feedback approach. This approach is clearly described by Jen Seevinck, according to whom:

> Reflective thoughts feed back into the concept/problem to redefine the way it is understood, and the process iterates as subsequent actions are guided by this redefined conceptual structure. With each iteration, the concept is explored. This is through sketching and creating prototypes as well as the artworks themselves (Seevinck 2013, 494).

I recorded my practice sessions and perfected the techniques by reflectively listening back to the recordings. During the listening sessions, I would evaluate the results in relation to the envisaged musical result I was after. At the following sessions, I would then refine the successful techniques or make new attempts for those that proved infructuous. I kept myself open to experimentation and surprise. As Donald Schön points out:

> In each instance, the practitioner allows himself [sic] to experience surprise, puzzlement, or confusion in a situation which he [sic] finds uncertain or unique. He [sic] reflects on the phenomena before him [sic], and on the prior understandings which have been implicit in his [sic] behaviour. He [sic] carries out an experiment which serves to generate both a new understanding of the phenomena and a change in the situation (Schön 2008, 84).

I developed strategies for musical interaction during rehearsals and workshop meetings. The *Contemporary Improvisation Workshop* I directed between January 2016 and June 2017 at Reid School of Music served as a laboratory for practising and testing the aspects of my research related to group improvisation and musical interaction. The Workshop – associated with the course in *Intercultural Music Performance* – was composed of musicians from different background and skills. During the sessions, I focused on strategies of interaction and improvisation proper to free improvisation, such as those described by Raymond MacDonald and Graeme Wilson (2015): strategies that allow the creation of music without pre-established directions or materials.

The creative enquiry required the use of various software tools in order to respond to the specific questions arising in the different phases of the research. *Logic Pro X* was fundamental for the composition of *Bad Habits*, which proceeded mostly in empirical terms. I also used *Logic Pro X*'s sample machines for the composition of *No Dance Otherwise* and *All'Erva Radicchia*. I hand-wrote the scores at first and then transcribed the music in music editors. I wrote traditionally notated music in *Sibelius* and used software such as *Photoshop* for the preparation of graphic signs and notations. *All'Erva Radicchia*, with its grid-like page layout and the symbol-notation, was instead laid out in *Microsoft Excel*.

4.2 The what and how

In an article that has the flavour of a political manifesto, a declaration of intents, and a set of instructions for the generations to come, Béla Bartók suggests the approach that modern composers should adopt when using folk elements (Bartók 2010). He proclaims that:

> The effects of peasant music [on modern music] cannot be deep and permanent unless this music is studied in the country as part of a life shared with the peasants. It is not enough to study it as it is stored up in museums. It is the character of peasant music, indescribable in

> words, that must find its way into our music. It must be pervaded by the very atmosphere of peasant culture. Peasant motifs (or imitations of such motifs) will only lend our music some new ornaments: nothing more (Bartók 2010, 20).

Bartók's statement is decidedly valuable from both an ethnomusicological and a compositional point of view. For the researcher of folk music, this assertion can be interpreted as a well-grounded methodological imperative. Folk music must be studied in depth among the people who produce it, rather than being approached as a self-standing, unhistorical object. Such a methodological recommendation guided my choice for the methods of enquiry into folk music that I discussed in Chapter 2.

However, Bartók's statement is also a methodological imperative for those composers who intend to incorporate folk music elements in their work. The Hungarian composer also highlights how a superficial adoption of folk melodies or their imitation adds very little substance – nothing more than "some new ornaments" – to the realm of contemporary music. Composers must absorb and master the idiom of folk music as if it were their mother tongue (Bartók 2010). To master an idiom or a language, one should not limit oneself to learning the vocabulary: one must learn phonetics, the grammar, the syntax and the different linguistic registers. To be creative with that language, then, one must understand the conceptual structures underlying it and the cultural context in which that language functions. For the Hungarian composer, that meant to deeply investigate the structural features of folk music and absorb them into his compositional style. In that way, key elements of folk musical construction led Bartók to develop his personal style and music. For instance, the concept of polymodality, as well as the adoption of the 7^{th} as a "consonance", derived from his research on pentatonic scales and their symmetry. Similarly, the metric variability of Hungarian music led him to the adoption of variable metric durations in his compositions (Bartók and Suchoff 1992; Vauclain 1981).

In the post-Cage and post-Coleman music era, composers have been challenging established musical practices in search for new ways of producing and perceiving music. This is pursued even by inventing new musical languages or questioning the very concept of music (Griffiths 2010; Gottschalk 2016). Anthony Braxton's *Ghost Trance Music* offers an example of how structural elements of a folk tradition have influenced the development of a contemporary musical practice. Braxton adopted the continuous, uninterrupted drumming of Native Americans' Ghost Dance Music – music played during trance rituals – as the foundation of a

musical research path that has lasted for over 30 years. In *Ghost Trance Music*, the steady pulse of the trance ceremonies is transformed into an uninterrupted, never-ending melody which allows Braxton to establish complex interactions among the performers and construct greater musical architectures by bringing together and migrating through different compositions (Haring 2011).

As a composer, my objectives are to push the boundaries in the search to develop a personal musical style and to expand the field of composition with new practices. My knowledge of Calabrian music and the research I conducted on the topic have become the theoretical framework in which I resolved to look for expanding my practice as a composer. In accordance with Bartók's suggestions for investigating thoroughly folk music to understand its deepest structures, and following the example of musicians such as Anthony Braxton, my research has focused on key features of the musical world of Calabria. The ethnomusicological methods described previously serve as a theoretical framework for the practice-led research, and the data that emerged through that enquiry serve as source material for my composition of contemporary music. The music I produced during the doctoral years was not limited to the adoption of Calabrian musical vocabulary and melodies, being, instead, primarily concerned with exploring the use of its structural features. As an ethnomusicologist, I focused on core features of Calabrian music, such as its generative principles, the use of limited musical resources, the tuning system and process of the bagpipes, and the perception of sound and its relationship with the environment discussed in Chapter 3. Similarly, as a composer and practitioner, I focused on building a practice from the data that emerged in that enquiry. Each set of data posed different challenges due to their diversified nature and required specific creative and compositional approaches. The way I integrated these sets of data into my musical practice was informed by the methodologies of the composers discussed in these pages.

4.3 Contemporary music?

"Today, we have reached a point where diversity and confluence occupy central positions in our musical life" (Radano 2009, 6) and "the nebulous categories of popular and art blur into a complex and encompassing web of subverted binaries, […] a world in which 'fragmentation is the essence' (11)." Ronald Radano registers

such fragmentation in the music of Anthony Braxton; he describes Braxton's music as characterised by a so-called post-modern approach, for it searches into different genres and draws from various sources, from both high and popular art realms. Scholar and musician George Lewis (2007) portrays a similar fragmented scenery when he asserts that we are entering a period in which old genre distinctions become challenging to delineate. Jennie Gottschalk (2016) registers a similar fragmentation in her quest for a definition of *experimental music*. In such a scattered reality as the world of contemporary music, she resolves this by defining the object of her essay as a "position – of openness, of enquiry, of uncertainty, of discovery" (2016, 2). This "position" is determined so that the most diverse music and composers would meet that definition as long as their practice is in a way experimental in challenging the established categories of music and accepted practices for musical production and reception.

I find it problematic to define a clear and univocal context for the musical outputs of my research. The problem derives from many factors which, I believe, are linked to the fragmentation of information that has intensified with the development of the mass media, the advent of digital technology, and the Internet. I tend to identify the music I make with the term 'contemporary music', although the meaning of such a definition is difficult to grasp. The qualifier 'contemporary music', far from being elucidative, can also be used to confine and exclude. In fact, it can be "used […] to delineate a racialised location of [European and American] tradition within the space of whiteness" (Lewis 1996, 102). My use of 'contemporary music' wants to be inclusive and encompass disparate musical experiences, hopefully free from the Eurocentric/Afrocentric opposition. Defining 'contemporary music' in more positive and comprehensive terms is the aim of this section. Here, I also describe the artistic context in which the music produced throughout the research could be placed.

As I discussed earlier, the nature of the musical research I undertook could associate my work, at least to some extent, to that of Béla Bartók. In fact, both are structurally grounded in a folk tradition and adopt folk materials for developing a contemporary music practice. While Bartók's research was informed primarily by Hungarian, Romanian and Arab folk music (Lampert 2008), mine draws its source material from Calabrian folk music. In a similar way to Bartók's, the folk resources have been used creatively and flexibly in a very different context than the original. They permeate the music both at the surface and at a structural level. Besides the affinity of the theoretical framework in which the music has been developed, I also

drew on Bartók's polymodal technique (Vauclain 1981), and extended it with techniques derived from Forte's pitch class (Forte 1973) in composing *High and Subtle*, for chamber ensemble. However, besides the mentioned similarities, my music could not be placed in a direct continuum with that of the Hungarian composer. As a musician who grew up in the digital era, and because of my research interest in improvisation and variation, which are entirely extraneous to Bartók's music, my musical legacy has to be found elsewhere.

Being born in the digital era, I have been exposed to the most diverse musical influences. My interests have gone overwhelmingly beyond one single musical genre, both as a listener and as a practitioner. The many different kinds of music I have listened to, loved, and performed have each exerted their influence on me in their own particular way. This sort of eclectic fragmentation reflects in my practice as a musician. As a bagpiper and accordion player, I play traditional music from Central Calabria. As a saxophone player, I have performed many different genres of popular music such as cumbia, Balkan music, funk, rock, jazz and free improvisation. As a composer-improviser, I am fascinated by European, American and Afro-American contemporary music; I am interested in exploring the relationships between composition and improvisation, and the expressive potential of improvised music. In such fragmentation of interests, it is impractical to identify a single category or genre in which my music could fit comfortably. Considering that the composers who mainly informed my research are included in Gottschalk's book – for instance James Tenney, Chiyoko Szlavnics, Anthony Braxton, Roscoe Mitchell and Marc Sabat, among others – the music I produced throughout the research could probably fit her definition of experimental music.

A constant reference for my musical practice has also been the work of Afro-American and European composers-improvisers of the post-Coleman/post-Ayler continuum. The work of musicians such as, among others, Evan Parker, Derek Bailey, Tristan Honsinger, Anthony Braxton, Roscoe Mitchell and Tim Berne, has decidedly contributed to my musical development and provided a tradition to draw on for techniques and language. From the European and American improvisers, I borrowed the collaborative approach to music-making, the direct involvement of the performers in the creative process, and the first-hand participation of the composer in the performance. The work of Afro-American composers of the post-Coleman/post-Ayler continuum has always been a constant reference in my practice as a musician. I believe that, in some ways, the music created during my research

can be placed in a dialectical relationship with the experiences that emerged from the *Association for the Advancement of Creative Musicians*, that of Anthony Braxton and that of other musicians associated to those practices. My music has been informed by many of the concepts theorised and developed by the Chicago-based musicians, for instance:

- The "composer-improviser orientation" (Lewis 1996) and the direct involvement of the composer in the performance.
- The exploration of the relationships between composition and improvisation.
- An experimental approach to sound and music material, which can be associated to some extent with post-war American experimentalism (Radano 2009; Gottschalk 2016).
- A broad, open-minded attention to different sources both from high and popular art forms; a sort of eclecticism which has been referred to as post-modern (Radano 2009; Lewis 2008).
- Experimentations conducted with modular composition and improvisation (Braxton 1988).

However, my music does not bear the political and social implications related to black segregation and the civil rights movements (Lewis 2008). Furthermore, it shows a much looser link with jazz when compared to that of the Chicagoans. Although jazz has played a significant role in my development as a musician, my bonds with this music are not as strong as for the post-Coleman improvisers and composers whose music came to light in the 1960s. For them, the connection with that music represented a strong bond because of both a conscious and a somewhat forced continuity with the jazz tradition. In Anthony Braxton's words, "jazz is the word that's used to delineate the parameters that African-Americans are allowed to function in, a 'sanctioned' zone" (Lock 1988, 92).

Italian philosopher Giorgio Agamben (2008) reflects on the meaning of the term 'contemporary' in a booklet that revolves around the questions "Of whom and of what are we contemporaries?" and "What does it mean to be contemporary?" Agamben concludes that being contemporary means being in a dialectic relationship with history and with the present; it means to look at the present as an archaeologist; to be able to recognise light in the dark spots of the present time; to recognise the fracture in the continuum of time; to be able to catch the moment when past, present and future turn up for an "appointment that one cannot but miss"

(Agamben 2009). This definition seems to recall the concept of fragmentation described by Lewis, Radano and Gottschalk. With a somewhat stretched interpretation in musical terms, Agamben's definition could mean to recognise relationships between different musical experiences and histories in a dialectic convergence. Therefore, defining my work as 'contemporary music' would suggest an encompassing positive attitude to the fragmentation of the present times.

4.4 Variation, indeterminacy, improvisation

In Sections 2.5 and 3.3, I discussed variation as a major feature of Calabrian music that functions on a profound interrelationship between the stability of a model and the real-time agency of the performer. In such a process, the stable elements make the repertoire, which is bound to the cultural means shared within a community. The mobile component is instead influenced by the performer's aesthetic taste, musicianship, personality, and training. It manifests in the process of personalisation of the repertoire and in the real-time manipulation of the musical material. The tension between stability and variation results in music with a distinctly recognisable and reproducible identity, although presented differently at every performance. This approach to variation has been one of the central topics in my artistic investigations. In the music produced in this creative enquiry, I investigated its implication with elements of indeterminacy, agency, and with strategies for musical interaction.

According to Caporaletti (2005), *extemporisation* is proper of oral traditions and derives from the *audio-tactile principle*, an embodied cognitive process that governs music generation and perception. It is strictly related to the oral transmission of musical information freed from the visual medium of the score. Caporaletti identifies the *audio-tactile principle* also in what he defines as *post-modern electronic culture*, a music culture that revolves around both visual and auditory media. I believe that my use of variation could be situated in this context as I have tried to translate the Calabrian approach to extemporisation into a practice for contemporary music. My music relies both on the stability of the medium (either a recording or a score) and the mobility of practice-oriented approach to music creation. In some cases, my approach has been more radical, and I attempted to create an oral tradition of my own playing – i.e. in my saxophone solos. In others, I incorporated Calabrian

variation techniques in music more dependent on mixed media, where the score works as a “cultural framework” in which music takes place. In these cases, the rehearsals are the place to establish an oral practice for the music at hand. The dialectic relationship initiated by the folk musician with tradition is translated into a dialectic relationship established by the performer with the conceptual framework provided by the score and the practice developed in rehearsals.

Caporaletti defines *extemporisation* as an improvisational strategy, although he distinguishes it from what he intends for proper improvisation. One may argue that *extemporisation* is a subset of improvisation and therefore relate these real-time processes as pertaining to a similar realm of investigation. As a musician who is genuinely interested in exploring the relationships between improvisation and composition, Calabrian real-time strategies opened for me new paths for exploration. The implementation of variation in my musical practice translated into an investigation of improvisation, agency, openness and indeterminacy.

In 1950, composers started to explore open forms and experimented with more “expressive systems of notation” (Lewis 1996, 91). They also implemented strategies that allowed the performers to contribute creatively to the realisation of a composition in the course of performance. Composers have been exploring elements of indeterminacy, variation, unpredictability, improvisation, agency and personality in their musical works, “thereby renewing an interest in the generation of musical structure in real time as a formal aspect of a composed work” (91). These compositional and improvisation strategies shifted the focus from the music composed on paper to the music experienced in performance and highlighted elements of uniqueness in the performance act.

References for my interest in improvisation can be found in the traditions that sprouted from jazz from the 1960s on. Although the growing interest in improvisational practices in Western contemporary music is not ascribable only to it, black music certainly has played a significant, if not crucial, role by exerting either fascination or repulsion on composers throughout the century (Lewis 1996; Mouëllic 2000).

Improvisation can be viewed as a trans-cultural process that spans all musical genres: it is practised and experienced in ways shaped by the specific musical context (MacDonald, Wilson, and Miell 2011). The world of improvised music is composite and encompasses a wide range of experiences and practices. Some improvisers have centred their music-making around the absolute absence of

preconceived musical materials or themes, as well as the lack of any sort of agreement on the performance. In these cases, improvisation of music by two or more individuals is a creative activity that unfolds in real time within a social group: the choices of the improviser shape the music in the moment, independent of verbal or visual communication (Wilson and MacDonald 2015, 2). Sometimes, improvisers have tried to clear their music from any possible historical reference, in search for an absolute autonomy and alterity both from the jazz and the classical traditions (Lewis 1996). In some cases, the approach is so radical that musicians refuse to search for agreements even after the performance. For instance, musicians from AMM agreed to never discuss their music, probably to avoid arriving at "an unwelcome consensus about what constituted a 'good' performance, and influence one another towards some sort of ideal sound, rather than a spontaneous response to one another and all of the circumstances of the situation" (Gottschalk 2016, 191). Composers and improvisers have insisted on the search for a purely spontaneous act that is unmediated neither by historical reference nor by memory. This idea of spontaneity negates reference to anything that is known, most of all anything that is stylistically connoted. George Lewis strongly criticises this approach:

> [It] fails to account for [the] temporally multilaminar aspect of an improvisation. By fixing upon the surface level of immediate spontaneity, unsullied by reference to the past or foreshadowing of the future, the reduction of the notion of improvisative spontaneity to the present moment insists on ephemerality (Lewis 1996, 108).

A similar position is maintained by Evan Parker, for whom all previous musical experience comes into play during spontaneous music-making (Parker 1992). However, these approaches allowed musicians to deal with the exploration of texture, sound and colour, freeing them from the notions of theory, practice and hierarchy (Sansom 2001; Lewis 1996).

Composers and improvisers have also explored these processes in a composite practice by incorporating improvisational instances in composition, as well as composing music for improvisers. Many contemporary musicians have deeply investigated the overlapping of the two creative processes; for example, as George Lewis has noted, the members of AACM made music in which composed and improvised elements are deeply interrelated in inseparable units. He notes:

> "The ongoing binary opposition between composition and improvisation, present as an important trope in both modernist and postmodernist pan-European practice, lacked any real force among AACM composers, who were often drawn to collage and

> interpenetration strategies that blended, opposed, or ironically juxtaposed the two disciplines" (Lewis 2008, 361).

Several musicological studies have also highlighted the similarities between improvisation and composition. Ethnomusicologists have carried out significant investigations in that direction and have contributed to bridging the apparent gap between these two practices: a gap that often served a political agenda (Nooshin 2003). The relationship between text and extemporary creation has been pointed out as a major characteristic of folk music since the dawn of the discipline, and it is still one of the leading topics in the analysis of the generative principles of folk musics (see for instance Blacking 1974; Brailoiu 1978; Magrini 1988; Zadeh 2012; Fossum 2017). In a remarkably influential paper, Bruno Nettl (1974) draws attention to the similarities between improvisation and composition and concludes by placing the two processes at the ends of a continuum. He highlights how both performers and improvisers are in a constant relationship with a model, which in some cases is more stable and in others is “looser”. Thus, he concludes that:

> Perhaps we must abandon the idea of improvisation as a process separate from composition and adopt the view that performers improvise to some extent (Nettl 1974, 20).

Vincenzo Caporaletti’s previously discussed concept of *extemporisation* attempts to resolve this opposition in a similar, if not more radical, way (Caporaletti 2005). Also in relationship to jazz improvisation, John Sloboda’s psychological investigations recognise strong correspondences between the two phenomena. For him, the main difference lies in the musicians’ relationship with time: improvisers have to take unequivocal and quick decisions while composers can allow themselves to reconsider their choices (Sloboda 1985).

In their pursuit of ceding aspects of control to the performers and opening their music to the unexpected, composers have also identified different procedures, besides openly resorting to improvisation. They have investigated different strategies of indeterminacy or openness, such as non-conventional notations, graphic scores (Behrman 1965; Thomas, 2007) and conduction techniques (for instance Morris 2017). These techniques allow “selectivity in control” (Behrman 1965, 65) and facilitate a real-time transformation of the music material. Despite their differences, such practices often leave open aspects of the composition so as to enable agency for the performers, thus transforming the performance into a unique, non-repeatable event. As Jennie Gottschalk advises, terms such as interaction, indeterminacy and improvisation are not interchangeable, “but they

share a common centre: the unknown" (Gottschalk 2016, 188). Indeterminacy is the unknown itself, or the self that is subject to conditions. Improvisation is unknown in relation to time: the music unfolds through the act of performing. Interaction places the attention to the unknown in a social interaction where the actions of the agents are interdependent (Gottschalk 2016). Some composers have focused on one of these strategies to the point of refusing, when they do not openly oppose, the others – as did John Cage in his disavowal of improvisation (Feisst 2009). Other composers tend, instead, to integrate diverse strategies for bringing elements of variability to the composition, and bridge the gap between composition and improvisation. Positions that highlight the differences between these processes have been criticised both for their aesthetic implications (Boon 2004) and for their cultural and political ones (Lewis 1996). George Lewis analyses the social and racial implications of dividing such phenomena by ascribing this disjunction to power relationships in a Eurocentric/Afrocentric dialectic. Lewis concludes that open composition strategies and improvisation are strictly interrelated to the point that "indeterminacy could well be not a successor to improvisation but a subset of it" (1996, 105; for more developed account of the improvisation-indeterminacy relationship, see Lewis 2007).

All the strategies of real-time transformation of the sound material discussed in this section can be interpreted as means to introduce elements of variation and variability in contemporary music. As such, the experiences mentioned above provided methodological ground for the exploration of the Calabrian approach to variation. I resorted to free improvisation as a method of enquiry into sound and interaction mostly during the study phases of the research. These phases focused on the search "for sounds and the responses that attach to them rather than thinking them up, preparing them and producing them" (Bailey 1992, 130). The unrestricted openness of free improvisation proved a precious resource for exploring unknown sonic and musical territories, which probably would not be reached as naturally with a thoroughly pondered process. This approach was especially useful while composing my saxophone solo. Furthermore, the *Contemporary Improvisation Workshop* I led at the University of Edinburgh contributed to the elaboration of the interaction strategies that successively led to the composition of *Into the Pipe*, for saxophone quartet.

Most of all, I researched improvisation, and other variation processes, in strict relationship with the musical materials explored in the compositions. The specific

requirements of a given composition constitute a framework in which variation takes place. The aim is to allow agency within a well-specified framework. The composition, through a well-defined set of instructions, establishes a model for the performer to relate to. The model determined by the composition stands for the model to which the folk musician refers to in their performance. In Calabrian music, the performers establish a dialectic relationship with the model in accordance to their taste, skill and personality, by adhering to a culturally defined set of rules that delineate materials and methods for transformation to occur. In my music, the performer is asked to establish such a relationship with the score by adhering to the specific materials and methods defined by the composition and developed during the rehearsals. This way, I try to mirror the in-depth relationship of fixed and mobile elements found in Calabrian variation processes in a completely different musical context.

Although these relationships are explored in the context of contemporary music, I believe they do not strictly pertain to such a realm. The techniques of variation developed during the research could also be applied to different musical genres without restriction. Derek Bailey defined the music played by the so-called 'free improvisers' in the 1960s and 1970s as *non-idiomatic* improvisation. This term was mainly used to distinguish this music from other forms of improvisation which were described as *idiomatic* – meaning something that refers to and takes its identity from a specific genre. Instead, *non-idiomatic* improvisation is not usually tied to representing an idiomatic identity (Bailey 1992). However, one could counter Bailey's argument by asserting that free improvisation has developed into an idiom since it has evolved through the years, becoming a specific musical genre with its own techniques and practices (for a presentation of this argument, see Lewis 2015). Borrowing Bailey's concept and revising it to avoid such a terminological issue, I would refer to the composition and improvisation techniques investigated during my research as *trans-idiomatic,* meaning something that could be applied to different contexts and work in different music genres. These techniques, like those developed by the free improvisers, will hopefully enrich the palette of tools available to improvising musicians of any background.

4.5 Summary

This chapter discussed the theoretical framework in which I conducted the creative enquiry. The methodology sits within that of practice-led research, in which reflection *in* and *on* action is paramount. The creation of music is driven by my needs as a practitioner and abides by a rigorous methodology that relies on a profound understanding of Calabrian music principles. The work is conducted following Béla Bartók's methodological recommendations, although the music outcomes could be placed in a continuum with European and American improvisers and composers of the post-Coleman/post-Ayler continuum. The musical outcomes are defined within the realm of contemporary music, which is described as a critical approach to the fragmentation of the present times.

One of the principal concerns of this research is the translation of Calabrian variation principles into contemporary music practice, and enquiry into this problem is conducted within the framework of improvisation, openness, indeterminacy and agency. The exploration relies on available strategies as well as bespoke ones in response to the specific requirements of the creative process. The discourse on variation attempts to overcome the antithesis between Eurocentric and Afrocentric approaches to openness and agency (for a critique by its author of the Afrological-Eurological conception, see Lewis 2004). The music produced in this research seeks for the direct contribution of the performer to the creative process as the score establishes a framework within which music takes place.

The next chapter will present the creative process and the musical outcomes. The music produced throughout the research is discussed in detail in relation to the Calabrian music data examined in Chapter 3. This music can be grouped according to the three main areas of enquiry – variation, tuning and soundscapes – and each composition contained in the portfolio attached to this thesis mainly addresses one of these three themes.

Chapter 5
Musical outputs

In the previous chapters, I defined the conceptual and theoretical frameworks of the practice-led research, described the principal informants and identified the context for the creative enquiry. I also provided a possible interpretation of the outcomes of the creative enquiry in relation to the folk processes adopted. I will now step into the very object of the practice-led research and discuss the details of the composition outputs. Throughout this research, I produced six musical works lasting about one hour and forty minutes in total. In this chapter, I analyse these compositions and discuss their specific connection with the ethnomusicological research discussed previously.

First, I describe works primarily informed by *economy of means* and *micro-variation*: *Bad Habits*, and *High and Subtle.* The former represented the starting point of the entire research. With that work, I explored *economy of means* and *modular micro-variation* within the framework of an improvised performance for solo instrument. The latter explores the same principles in a more structured composition framework. *High and Subtle* – for chamber ensemble – is almost entirely constructed from a single musical cell derived from the *sunata* called *fina*. I describe the compositional and improvisational techniques I adopted for exploring Calabrian generative grammar in both pieces and reflect on the outcomes of that enquiry.

Section 5.3 describes three compositions informed by my studies on the tuning process and system of Calabrian bagpipes: *No Dance Otherwise* and *Alla Berlinota* – both for string quartet – and *Into the Pipe* – for saxophone quartet. The study of bagpipe tuning, and consequently the composition of these pieces, embraced the entire doctoral period. The pieces represent three different stages of that enquiry and are presented here in chronological order. Started at the end of the first year, I completed this part of the research during a period as a visiting researcher at the Universität der Künste in Berlin, where I researched intonation theory under the supervision of Marc Sabat.

In the last section, I discuss *All'erva Radicchia* – for goat bells. This composition derived from my research into Calabrian soundscapes and the use of bells for herd animals. *All'erva Radicchia* translates the complex harmonies of goat bells, the

unpredictability of the animals' behaviour and the soundscapes designed by Calabrian flocks into a piece of spatialised music that adopts indeterminacy as a fundamental technique.

5.1 Creative investigation of modularity and micro-variation 1: *Bad Habits* – nine pieces for saxophone solo

This writing describes the composition process of *Bad Habits*, a suite of nine pieces for saxophone solo. *Bad Habits* is the outcome of the application of the generative principles and the performance practices of Calabrian folk music to improvised music for solo instrument. The solo explores the creative use of two fundamentals of Calabrian music: what I described as *economy of means*, and *micro-variation*.

Initially, I contextualise the choice of working on a piece for solo instrument both concerning a common instrumental practice in Calabria, and a consolidated tradition of the instrumental solo in contemporary improvised music.

Afterwards, I examine the composition methods adopted and describe various phases of the process, from practice to the drafting of studies; from the recording sessions to the final stages of the composition. For this composition, I conceived a set of graphic signs that could notate the musical processes I was after. This notation system, described in Section 0, responds to the need for conveying the flexibility observed in Calabrian music materials and reproducing those performance techniques.

Finally, I describe the nine pieces. In this section, I provide the scores and their interpretation, and links to the respective sound files. I also briefly discuss how the studies and sketches elaborated in the early phase of the composition process merged in the final versions of the pieces.

5.1.1 The tradition of the instrumental solo

I composed the saxophone solo object of this writing during the first five months of my PhD. I intended it as a laboratory in which to first approach and test the musical object of my research. I decided to work on music for solo instrument for

two reasons: solo is a consolidated practice both in Calabrian music and in contemporary improvised music.

A consistent part of Calabrian music is performed on solo instruments, and the practice is essential and widespread in the region. For instance, in Central Calabria, dance repertoire is commonly played only by an unaccompanied *organetto* or solo bagpipes. Examples of solo music are found in the repertoire for the *lira* (Ricci and Tucci 2004; Plastino 1994), double cane flute (Ricci and Tucci 2004 track 3; La Vena 1994), bagpipes (La Vena 2003; 2005) and accordion (Lomax 1999 track 6; Ferlaino 2017; Bressi et al. 2017). Indeed, most of these instruments are somewhat suited to being self-sufficient because of their polyphonic character, for they are conceived so to produce music that is complete, missing no parts or lines. Nevertheless, examples of monodic instruments used in a solo setting are to be found widely in the region – for instance, music for cane flute (La Vena 2001; Ferlaino 2017). Also in ensemble music, the instruments often retain their soloist function. As Tullia Magrini points out concerning ensemble music:

> We don't find an ordered distribution of different musical instruments but rather a common aim at realizing a 'heap' of sound; […] we see no interest in the importance of the individual functions of the single instruments (Magrini 1989, 91).

In other words, ensemble music is the sum of different solos performed on each of the instruments involved. Furthermore, solo instrumental music is strongly characterised by *economy of means* and *micro-variation*: the pieces analysed in Sections 0 and 3.3.5 are indeed pieces for unaccompanied *organetto.* In undertaking research into the generative principles of Calabrian music, I deemed it essential to retain a reference to this traditional performance practice and start my investigations with a work for solo instrument.

The choice of working on a saxophone solo was motivated also by an established practice in contemporary improvised music. Solos have been widely used in recent history as a framework for testing and developing new instrumental languages and techniques. Examples can be found in an extensive discography of improvisers and instrumentalists, ranging from Anthony Braxton (1970; 1979) to Bill Dixon (1984), from Evan Parker (1976) to Fred Frith (2001). Experimentalists have found in instrumental solo the preferential setting for the development of new musical and personal languages. The experimentations conducted in solo often become the foundation of more complex musical systems. Anthony Braxton's *language types* provide an excellent example of such a practice. Born as a

systematisation of musical resources for the development of a personal language for saxophone solo, they became the foundation of all Braxton's musical research to come (Radano 2009).

The instrumental solo being a traditional practice both in Calabrian music and in experimental music, I deemed this setting a perfect point of convergence of these two quite disparate musical worlds. Thus, the solo became the most suitable test bench for my creative investigations in the adoption of folk music instances into a practice for contemporary music.

5.1.2 Composition process

Economy of means and *micro-variation* became the core principles of a prescriptive system that led to the composition of *Bad Habits*. While composing the solo, I was mainly concerned with making music whose functioning reproduced the generative principles of the Calabrian folk tradition. My focus was primarily on the musical grammar, rather than the vocabulary, from which I borrowed very little. Consequently, the sonic reference to folk music is in general not very explicit.

I developed the solo through a performance-oriented composition process, starting with a study phase that lasted almost three months. In the early stages, I focused mainly on limiting the musical materials: during the practice sessions, I would define a musical cell that I would use to construct a solo improvisation. During the laboratory period, I focused primarily on elaborating strategies to develop a musical discourse from the materials at hand. I also worked out appropriate techniques that could allow me to reproduce the sonic environment I was after. This phase involved hours of saxophone practice to explore an instrumental sound-world that could serve the purpose. During these sessions, I would mainly practice melodic, timbral and rhythmic variation on materials generated through improvisation. At the same time, I would transcribe Calabrian dance music and learn to play it on my saxophone.

My constant reference was a corpus of post-Coleman solo recordings. I especially referred to works for solo saxophone by Anthony Braxton (1970; 1979), Roscoe Mitchell (1974), Evan Parker (1976) and Edoardo Marraffa (2000), among other musicians who deeply investigated the sound possibilities of the saxophone in search for new languages. Simultaneously, I studied books on both conventional and extended saxophone techniques. I focused on issues related to emission and

sound production (Liebman 2006), overtones (Rascher 1942), multiphonics (Kientzy 1982) and other extended techniques (Londeix 1989; Kientzy 1993). To achieve the sound I was after, I also had to develop new techniques and fingerings which departed from the known literature. In particular, in order to develop the polyphonic environment which I would successively adopt in some pieces of the solo, I had to identify a combination of techniques that could render the sound environment I was looking for. Bespoke technical solutions involved forced embouchure, throat reconfiguration, throat singing, overtone superimposition and other unorthodox techniques.

After a phase of experimentation with improvised elements, I focused on identifying and fixing musical materials which could be more suitable, or compelling, for the task at hand and that I deemed more responsive to my creative needs. These musical cells would work as *girate* upon which I would act through repetition and *micro-variation*. At this stage, I also began to work on a system that could notate the findings I was coming upon.

I devised seven composition studies that reproduced the variation techniques I observed in Calabrian music. Each study focused on a specific set of parameters that would work as a formulaic principle, which in turn could be used for generating *girate*. Most of the materials devised in the studies were subsequently adopted in the composition of the actual pieces. After mastering each specific technique, I addressed my attention to polishing the studies so that they would convey an artistic intent.

The actual composition process was carried out throughout five recording sessions, for a total of about seven hours of recorded material. Reflective listening fed back new inputs for the next attempts. The listening sessions allowed me to evaluate if the music played was pertinent to the research objectives, as well as identify corrections and modifications to be subsequently tried in new recording sessions. The versions published on the CD *Bad Habits* (Ferlaino 2016), produced by the Berlin-based label AutRecords, were selected from the last two recording sessions. They include all the pieces worked out during the study phase with the addition of two pieces that I elaborated during the recording sessions.

5.1.3 The solo

In Section 3.3, I described a generative principle based on the constant repetition and micro-variation of short passages of music, or even of a single musical cell. The performers share salient characteristics of the cell, which works as a formulaic principle; they *extemporise* the principle in a series of *girate*, different actualisations that are strung together and recombined in real time. I also discussed how this process relies on the limitedness of the musical material adopted, and on a profound, embodied knowledge of the principles that govern that music. My saxophone solo attempts to reproduce those generative principles by working on *micro-variation* and economy of musical resources in a real-time performance setting. Every piece is generated through small musical cells that are transformed through repetition and variation in real time. *Modular micro-variation* is the leading improvisation principle underlying the whole work. The short, written elements define musical materials from which each improvisation is to be developed through a set of given parameters and other variables. The written, constant material takes over the place held by memory and culture in folk music: it can be compared to the shared formulaic principles that define the repertoire in Calabrian dance music. The given instructions and variables determine, in contrast, the framework within which variation takes place. They can be compared to the mobile part of the system, the culturally informed practices on which Calabrian musicians draw for extemporising the musical materials. Coupled with the performer's personality and creativity, they push both system and content towards transformation. Therefore, the score defines a series of flexible parameters that work as an underlying formulaic principle that is to be realised in real time. The scanty materials defined in the score, rather than prescribing the envisaged outcome, define a series of instruction for the performer for constructing a text in real time, thus reproducing the way folk musicians extemporise their music (Caporaletti 2005).

The musical materials adopted in the solo are mostly original or derived from contemporary sources. Only in two pieces, *Le Cattive Abitudini Dello Zampognaro* and partially in *Cutting Grace,* did I resort to elements derived from the Calabrian musical vocabulary.

To allow my solo music to be described, analysed and eventually shared with other performers, I devised a system that allows the notation of *girate* in an intelligible way. I combined traditional music notation with a custom set of graphic

signs that prescriptively codify improvisational parameters for reproducing the processes observed in folk music variation. This notation system provides the musician with a series of parameters that are to be used when improvising. The score supplies the core musical materials and a set of instructions for transforming them. This system defines a framework for improvisation, while leaving some parameters open to interpretation and variation. The system is intended for the performer to approach the written compositions as *girate*, thus as flexible entities that define a set of variables through which to build the musical discourse. The performer is invited to make the musical materials their own, so as to adapt and transform them according to personal taste, skills and musicianship, within the given framework. The notation system counterbalances the fixity of traditional music notation by introducing elements of indeterminacy. Some of the signs I used in the solo are borrowed either from traditional notation or from other composers' custom graphics, whereas other are custom-made for this task.

Forward motion (rhythmic activity)

Horizontal line with 1–5 notches.

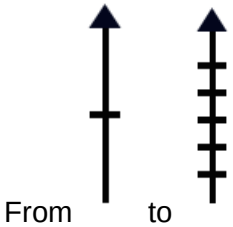
from

to

This sign prescribes sound activity in the temporal dimension. It goes from 1 to 5 notches: from a static to a very active sound space. With one notch, it prescribes little activity in time, more space between sound events, use of silence and, or, of long tones. With five notches, the sign prescribes a very active, crowded, and dense space, more sound events in time, and shorter breaks.

Vertical motion (pitch activity)

Vertical line with 1-5 notches.

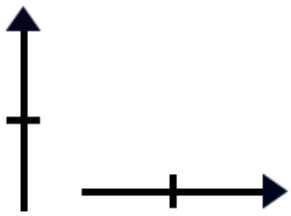


From to

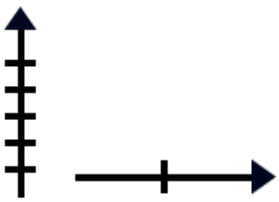
This prescribes activity over the pitch spectrum. It goes from 1 to 5 notches: from a closer and less dense pitch space to a wider and more crowded one. For instance, with one notch it prescribes the use of closer intervals or the use of a limited number of pitches; with five notches it means a vertical space with continually changing pitch and, or, wider intervals.

The two signs described above can be combined in 25 different ways, each of which prescribes different degrees of melodic and rhythmic activity.

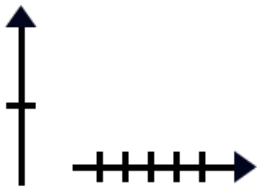
For example:



Long tones/long rests – one pitch/closer intervals



Long tones/long rests – continually changing pitch/ broader interval range



Very rhythmically active space – one pitch/closer intervals

Very rhythmically active space – continually changing pitch/very wide intervals

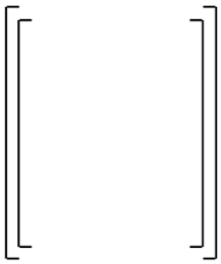
Variation

Plus sign in a circular arrow.

This sign asks the performer to transform the related sound material. Transformation applies to every parameter unless specified. When parameters are set, the performer will work on variations within the given frame; otherwise, free changes apply. This sign is usually combined with the following one to prescribe modular micro-variation.

Module

Double square brackets.

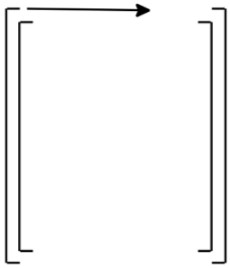


Open-ended module repetition: the material within the brackets is to be approached as a module. The module symbol is usually combined with the variation sign. The module is repeated ad libitum. If paired with stem-less notation (open

duration), it indicates a *harmonic defining principle,* which prescribes the melodic/harmonic material to be used in improvisation – see Section 5.1.3.3.

One-way module

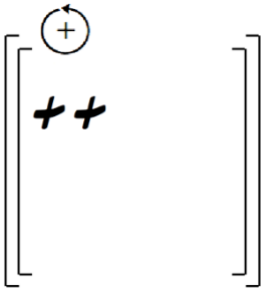
Double square brackets with an arrow.



This sign is usually associated with stem-less notation to distinguish it from the *harmonic defining principle* described above. The material within the module is to be read rigorously from left to right as a free-tempo line that unfolds melodically. Instead of prescribing melodic/harmonic material, the music contained within this sign works as a melody in which the rhythm is indeterminate.

Additive module

Double brackets with variation symbol and addition signs.



The content of the module is meant to be used as the core of a greater and extended musical entity. The performer can add musical material before and/or after the one notated in the sign, thus building a phrase that revolves around it. The performer can also embed the given material into an extended construction derived from it. This sign prescribes the materials to be approached as formulaic principles that are to be used as reference for generating *girate*.

Polyphonic set

Circle with an up-pointing arrow

This sets a polyphonic or semi-polyphonic environment. That is, the superimposition of pitches using various techniques – in the saxophone solo these would be, for instance, multiphonics, layering of pitches in the mouthpiece or throat singing. When placed in the staff, its position designates the “tonal centre” of the polyphonic set.

5.1.3.1 *It Doesn’t Take Much*

File is located in */media/BadHabits/4_It_Doesn’t_Take_Much*

The process of transposing folk music’s variation concept into a saxophone solo began with minimising the choice of notes. I pushed the idea of *economy of means* to its limit; thus, I first focused on developing variations on one note only. Doing so, I was forced to direct my attention to parameters other than melody, such as duration, rhythm, tuning, timbre, sound quality and attack/decay/sustain.

At first, I devised two studies based on the variation of one note in a somewhat static environment. The studies pivoted respectively on an *A,* fingered in the high register of the saxophone, and a low *C#*. The two different positions in the instrument register forced the development of diverse sound outcomes, although the variation strategies involved were quite similar. While I discarded the first study, the second one evolved, with slight improvements, into *It Doesn’t Take Much*. The lower position in the instrument’s register promoted the superimposition of overtones and offered a richer palette for timbral transformations.

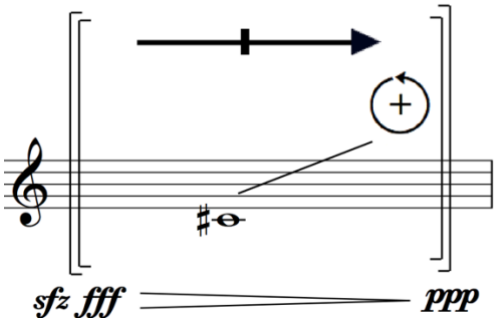


Figure 5.1 ***It Doesn't Take Much***

The piece asks the performer to finger a low *C#*, play long tones, and apply free transformations at each repetition. The temporal environment is static, so that long tones separated by rests are promoted. Variation can be exerted on almost every musical parameter but melody. For instance, the performer can transform the material in terms of tuning, timbre, sound quality, ADSR, etc.

A few examples could be:

- Tuning: bending, abrupt detuning, oscillations.
- Timbre: action on embouchure position and throat control of the harmonics.
- ADSR: dynamics, attack.
- Sound quality: natural multiphonics, forced embouchure multiphonics, alternative fingerings, mouthpiece-singing.

The sound environment of the piece is almost unvaried from its original version which did not prescribe the dynamic decrescendo – from *sfz fff* to *ppp* – throughout the piece. In the recorded version, I adopt a combination of different saxophone techniques for creating a stream of micro-varied versions of the module. At the beginning of the piece, I push the sforzando beyond the instrument's limit through the use of a loose embouchure. At the same time, throat singing, sound distortion, overtone emphasis – accomplished by displacing the larynx and altering the shape of the oral cavity – and flutter tonguing are used to achieve timbral transformations at every repetition.

5.1.3.2 Right?

File is located in */Media/BadHabits/7_Right?*

This piece brings into the solo a slightly more complex sound configuration than the previous composition. In fact, it consists of the repetition of a short cell based on a sequence of three notes plus a ghost-note. This composition also sets a polyphonic environment which unfolds over the notated material. The steady repetition of the written material, audible throughout the piece, layers the harmonic environment to which variation is applied. The final version is almost unvaried from the original study from which it was developed.

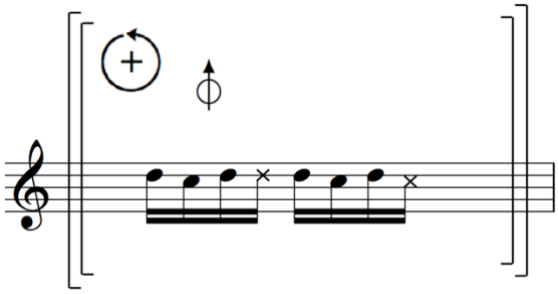


Figure 5.2 *Right?*

The piece asks the performer to play and repeat the written cell with a steady pulse, set a polyphonic environment, and transform through timbral variation.

In the recorded version, I played a short, improvised introduction based on quick phrases, each ending with the core element of the composition. After this introduction, I play the module and apply micro-variation. A combination of orthodox and alternative fingerings breaks the air stream in the instrument and facilitates the polyphonic outcome: throat singing and larynx control then determine the overtone quality of the polyphony.

5.1.3.3 *Thesaurus of Musical Invective*

File is located in */Media/BadHabits/6_The_Thesaurus_Of_Musical_Invective*

This piece explores *economy of means* outside the framework of micro-variation. A four-note mode is the source of free melodic construction. I borrowed the sound material used in this piece from Nicolas Slonimsky's fourth *tritone progression – interpolation of one note* (Slonimsky 1986, 1). This mode facilitates an intervallic

approach to melodic construction. Furthermore, its internal symmetry allows one to shift the tonal centre and create multiple modal/melodic focuses.

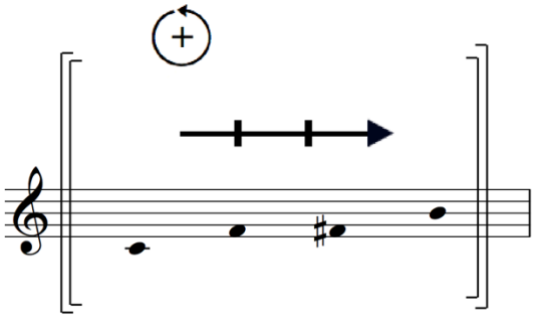


Figure 5.3 ***Thesaurus of Musical Invective***

The composition asks the performer to improvise melodic lines, in a medium-slow tempo, constructed with the given four-note module. This composition originated from the development of a concept used by Anthony Braxton in his *Composition 77E* (Braxton 1979). Braxton describes this piece as generated from a "five-notes principle as a basis to reinvestigate the concept of harmony and open material formings" (Braxton 1988, 196). Braxton conceived this composition as a "module-like sound state", which places it in close relation to folk music. In fact, the composition is described as a vehicle to make shakuhachi-type music.[31] The reference to folk music in Braxton's writing is stated as an opportunity to connect to the work of ancient Asian masters. The music environment that Braxton describes is very dynamic, although the five-note principle works solely as the parameter that defines the harmonic space in which music takes place. Braxton's *harmonic defining principle* sets the module's musical content and reference system on which variation should take place.

Similarly, the four-note mode in *Thesaurus of Musical Invective* works as a *harmonic defining principle* to be adopted for improvising extended melodic constructions. In this piece, the four-note limited sound resources are the ground for melodic construction in a medium-slow forward motion. In fact, this composition promotes melodic development as the primary locus for variation.

[31] The shakuhachi is an ancient Japanese end-blown bamboo flute, whose playing technique requires great mastery and control.

5.1.3.4 *All Work and No Play*

File is located in */Media/BadHabits/2_All_Work_And_No_Play*

This piece sets a framework for improvisation based on a nebula of jagged sounds (Braxton 1988) in a rhythmically dense sound space. The composition originates from the application of e*conomy of means* to a more abstract sound environment than in the preceding pieces. In fact, whereas *Thesaurus of Musical Invective* revolves around a melodic principle, in *All Work and No Play,* the stable element on which the performer is asked to apply variation is a sound principle.

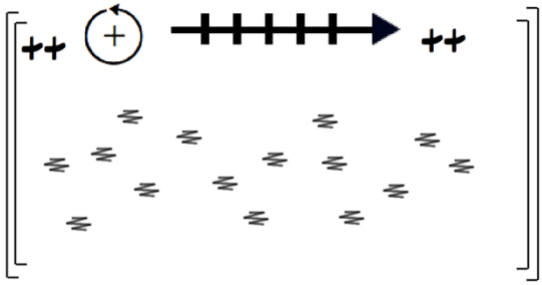


Figure 5.4 ***All Work and No Play***

This piece asks the performer to construct a musical discourse from jagged sound in a dense sound environment. In the recordings, I obtain the jagged sounds through a combination of stressed embouchure and larynx displacement, with decoupled non-conventional fingerings. This is a bespoke technique that I developed in the study phase of the solo.

5.1.3.5 *All's Well That Ends Well*

File is located in */Media/BadHabits/8_All's_Well_That_Ends_Well*

All's Well That Ends Well is divided into two parts as it is built on the juxtaposition of two different sound environments. A somewhat static and soft first movement is opposed to a busy, dense and loud final part. The first part is a development of the principles adopted in *Thesaurus of Musical Invective*; the second is a furthering of my studies on the variation of a single note described in *It Doesn't Take Much*.

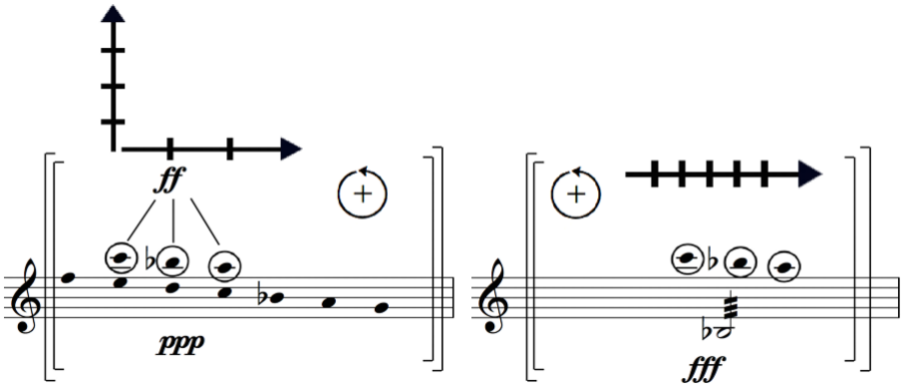


Figure 5.5 ***All's Well That Ends Well***

In the first part, the performer is asked to improvise melodic constructions with relatively wide intervals using the notated scale. In the rather static sonic environment, the circled pitches pierce through the melodic constructions. In the second part, the performer is asked to vary a low *Bb* tremolo in a rhythmically dense environment based on short notes separated by very short rests. The circled pitches also pierce through the rhythmic constructions.

The first part takes the approach to the melodic development described in Section 5.1.3.3 slightly further. The *sound defining principle* of this piece is a soft (*ppp*) diatonic scale which is interpolated with loud piercing sounds chosen among the circled notes. In this way, a counterpoint is set up between the two resulting lines. Thus, the performer creates two interlocking melodies to be varied within the parameters established by the score.

This dual focus is also maintained in the second section, where the piercing notes contrast with a steady tone. In fact, this second part pivots on the free rhythmical repetition of the low *Bb* of the instrument conflicting with the high piercing melody. While exploring variation on one note, I elaborated two studies where I would play one long tone and apply timbral and pitch modifications. A further step in that enquiry had been to work with shorter durations on a single note which I could also vary rhythmically. Those experimentations led to the exploration of an extremely crowded rhythmical space where the sound is pushed towards the timbral limits of the instrument. The materials adopted in the second part of *All's Well That Ends Well* are derived from those investigations. Variation is applied here to rhythm, timbre and pitch on a *Bb* tremolo. In the recording, the timbre variation is achieved by forcing the air through the instrument, thus breaking its natural sound. The result is a nebula of overtones which creates an ever-changing polyphonic environment.

5.1.3.6 *The Jaw Trick* – for Nicola

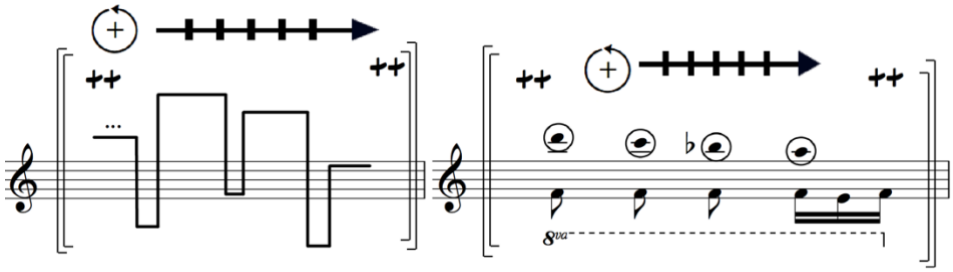


Figure 5.6 *The Jaw Trick* – for Nicola

File is located in */Media/BadHabits/9_The_Jaw_Trick_(For_Nicola)*

In the first part, the performer plays free, fast melodic lines that are based on an intervallic principle and use multiple staccatos. The sound environment is busy and very active. In the second part, the performer is asked to expand on and reiterate the written cell and apply melodic and rhythmic variation. The circled notes pierce throughout the repetitions.

This composition is also divided into two parts and develops some of the concepts discussed in the preceding ones. The first part expands the melodic concept described in *Thesaurus of Musical Invective.* While that composition revolves around a melodic principle based on a four-note mode, in *The Jaw Trick*, I develop the same concept in a more abstract melodic environment based on intervallic constructions. The constructions are played with multiple tonguing, notated in the score with the triple-staccato sign. The square-angled line graphics prescribes the use of *intervallic formings* and is borrowed from Anthony Braxton's *language types* (Braxton 1988). This first part could be described as a framework for improvisation where the melodic material is freely varied within a confined melodic parameter: that is, intervallic relationships of notes played with a triple-tongued staccato.

The second part of this composition is based on a concept similar to the one I used in the final part of *All's Well That Ends Well*. Here, I adopt a melodic-rhythmic cell based on a half-step interval. This cell is freely transformed regarding melody and rhythm and layered with contrapuntal formations created with the high piercing pitches, which are notated with circled notes.

5.1.3.7 *Cutting Grace*

File is located in */Media/BadHabits/3_Cutting_Grace*

This composition centres on *gracing* (Baines 1995), a performing technique borrowed from bagpipe music. *Gracing* is used worldwide and requires the piper to approach a note with a quick slide from a different pitch. Because of the uninterrupted airflow through their chanters, bagpipes can only produce legato sounds. *Gracing* allows the simulation of staccato on the otherwise continuous-sounding chanters of these instruments. Research in Calabria brought to light a use of *gracing* that transcends the mere technical application described above. In fact, *gracing* is extensively used in music played on instruments that allow the interruption of the air flow. For instance, music for cane flute extensively resorts to *gracing* even though the instrument can produce staccato sounds through a disruption of the air stream or through tonguing (Ferlaino 2017; La Vena 2001; 1996). The following is a transcription of a short excerpt of music for cane flute.[32]

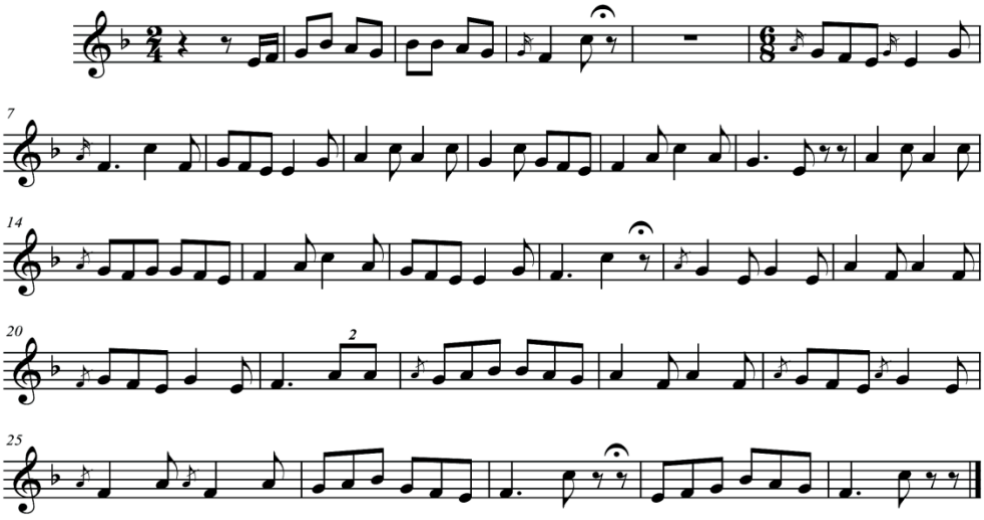


Figure 5.7 Dance tune played on a cane flute

It is correct to envisage the aesthetic characterisation and appreciation of *gracing* besides its mere technical employment. The aesthetic function also appears evident in bagpipe music itself. Studies have brought to light *sunate* that use grace

[32] I recorded this piece played by Vittorio Mendicino on 3 August 2005, published in Ferlaino (2017)

notes as a structural principle. For instance, in *sunate* like the *zopparella, gracing* is the core element of its *girate* (La Vena 2005).[33]

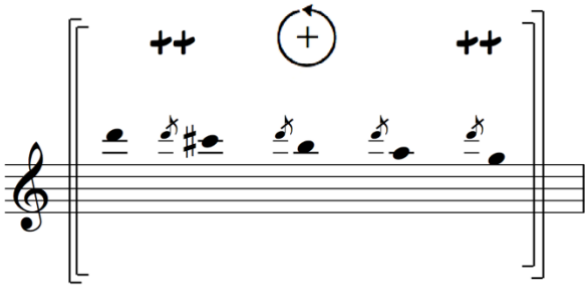


Figure 5.8 *Cutting Grace*

The piece asks the performer to improvise melodic constructions using the given five-note mode. The sounds must be approached by grace notes, which are an essential element of this piece.

The five-note set used in this piece reproduces the note-range of the *surdulina's* right chanter – see Figure 3.25. I conceived this composition as an imitation of the sound and music of the *zampogna*. The imitation of bagpipe music on different instruments is a common practice in Calabria. *Sunate alla zampognara* – "a la bagpipe" - are found extensively in the region in music for accordion (Ferlaino 2017) or *battente guitar* (Santagati and Villani 2010). Usually, this music imitates peculiar characteristics of the bagpipe within the limit of the instrument on which is played, rather than simply reproducing the original melodies. Thus, in this piece, the modular variation principle of *Thesaurus of Musical Invective* is extended with the imitation *alla zampognara*, also derived from Calabrian music.

5.1.3.8 Cattive Abitudini dello Zampognaro

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I developed this two-section composition from two different studies elaborated during the preparation phase: both of them were adopted, in this final version, almost unvaried from their original form.

[33] During my training as a bagpipe player, I was advised about the sound of this *sunata* by the onomatopoeic "chop chop", the sound of gracing sliding towards the low regions of the instrument.

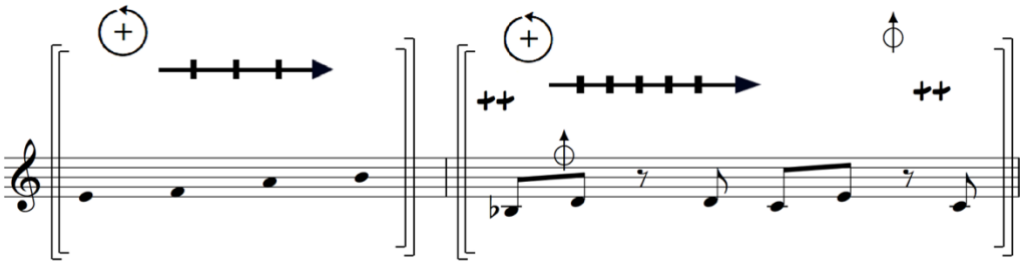

Figure 5.9 ***Cattive Abitudini dello Zampognaro***

In the first part, the performer improvises melodic constructions by using the given four-note mode. The rhythmic space is lightly active. This part adopts the *harmonic defining principle* described in Section 5.1.3.3. A four-note mode played in a slow tempo is the reference material for improvising extended melodic constructions, in which the performer explores the intervallic relationships of the mode.

An improvised transition leads to the second part that is based on a melodic fragment of bagpipe music. Here, the performer is asked to create a polyphonic environment that pivots on *F*. The written cell is played at the bottom of the polyphony, and varied rhythmically and melodically. The mimicking concept adopted in *Cutting Grace* is furthered through the use of a melodic fragment which recalls the *girate* of the *zampogna*. This module establishes a modal environment that oscillates between the areas of the first and the fifth degrees: this chord opposition reproduces the chord alternations of Calabrian bagpipe music. The imitation is completed by the semi-polyphonic environment established on the fifth note of the mode. In the recording, I achieve this polyphony through a combination of fast figurations that pivot on a fingered *F*, fingered multiphonics, alternative fingerings and transformation of the sound through the modification of the larynx's shape.

5.1.3.9 The Four Bass Hierarchy

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This composition is informed by many different techniques and sources. The core concept is derived from the peculiar identity principle of Calabrian *sunate* discussed in Section 3.3.6. In this piece, I wanted to test the peculiarities of the internal structuring of the musical elements in a *sunata*, and their respective value in defining its identity. In Section 3.3.6 I described an event that occurred to me during

my training as a folk musician. I described a “mistake” that led to fortuitous enlightenment on issues related to the perception of the identity of a *sunata*. I was fascinated by experimenting with the idea of having a musical element that is structurally more important for defining the identity of a piece than the melodic constructions it is a part of.

The *Four Bass Hierarchy* tries to reproduce that phenomenon in a somewhat more abstract improvisation domain. I translated the peculiar internal arrangement of the musical elements of Calabrian music through the construction of free melodies that end with a fixed formula.

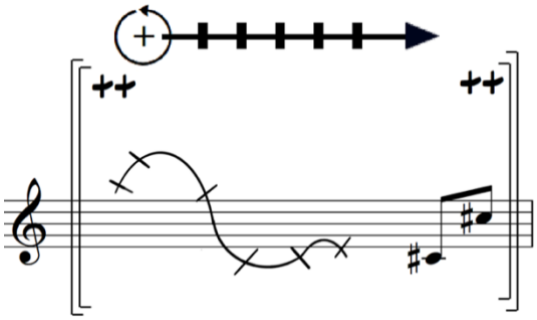

Figure 5.10 ***The Four Bass Hierarchy***

This piece asks the performer to improvise fast diatonic formations that end with the written octave interval. Phrases have free duration.

The curved notched line is described as *diatonic formings*, and is borrowed from Anthony Braxton’s *language types* (Braxton 1988). In this composition, it prescribes the improvisation of diatonic melodic formations which end with the *C#* octave interval formula. The extended melodic formations, performed in a very active sound environment, find a definition in the ending formula, in the same way that the *quattrubassi* is defined in the cadential bichord, regardless of the personal melodies deployed by the performers.

5.1.4 Conclusion

The work described in the preceding pages has proven successful in reproducing the balance between memory and variation I described in Calabrian music in Section 3.3. Each piece of the solo has a defined and recognisable character. Despite their scanty scores and the extensive improvised materials involved, the compositions are clearly defined as finite musical entities, which could

be reproduced and eventually shared. Throughout different performances of my solo pieces, I became able to produce similar qualities of conservation and transformation to those observed in different performances by the same folk musician.

The work conducted in the saxophone solo also opened new possibilities for my practice as an improviser. In time, I felt sufficiently confident with the strategies of varied iteration that I could depart from the composed materials in search of a more spontaneous performance platform. I came to master *micro-variation* and *economy of means,* so to allow myself to improvise materials and form, thus opening the solo to a more situated performance that responds to the artistic needs emerging in the moment.

5.2 Creative investigation of modularity and micro-variation 2: *High and Subtle*

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In the preceding sections, I discussed how concepts such as *economy of means* and *micro-variation* were explored from the point of view of solo improvisation. The same concepts also informed a composition for ensemble titled *High and Subtle* for violin, viola, cello, flute, clarinet and percussion. In this piece I extended that experimentation to a framework for ensemble improvisation; I also explored *economy of means* and *variation* in the context of predetermined composition.

In accordance with *economy of means*, almost the entire composition is based on the four-note melodic module of *fina*, the *sunata* analysed in Section 0. In the analyses of *fina*, I discussed how the entire *sunata* is generated through a stream of different realisations of a single underlying formulaic principle. In *High and Subtle* I wanted to keep a reference to this approach, and generated the whole composition from the fundamental melodic cell underlying *fina*. The *sunata* for *organetto* also gives the name to this composition: *fina*, in fact, translates as high (high-pitched) or subtle. The melodic fundament of *High and Subtle*, shown in Figure 5.11, is presented in different transpositions at the beginning of the piece. This musical figuration is in plagal mode, thus with augmented 4th; thus, the transposition shown in Figure 5.11 is in Ab.

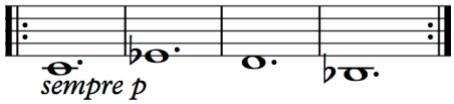

Figure 5.11 Melodic fragment underlying *High and Subtle* (bars 1–4)

After a brief homorhythmic presentation of the basic material, the performers are faced with a series of choices intended to bring *variation* into play. From bar 5, the performers, still playing homorhythmically, are asked to make real-time decisions and build their path through the musical material by choosing from what is presented to them on different staves. In section **B** at bar 13, the ensemble enters a module that the performers must transform through iteration and variation.

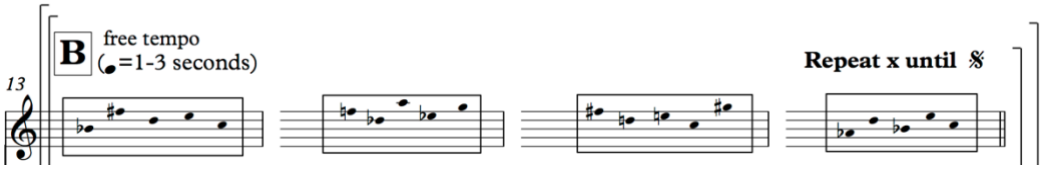

Figure 5.12 *High and Subtle*, score notation of module (bar 13)

The module, written in the score as in Figure 5.12, appears exploded into parts in Figure 5.13.

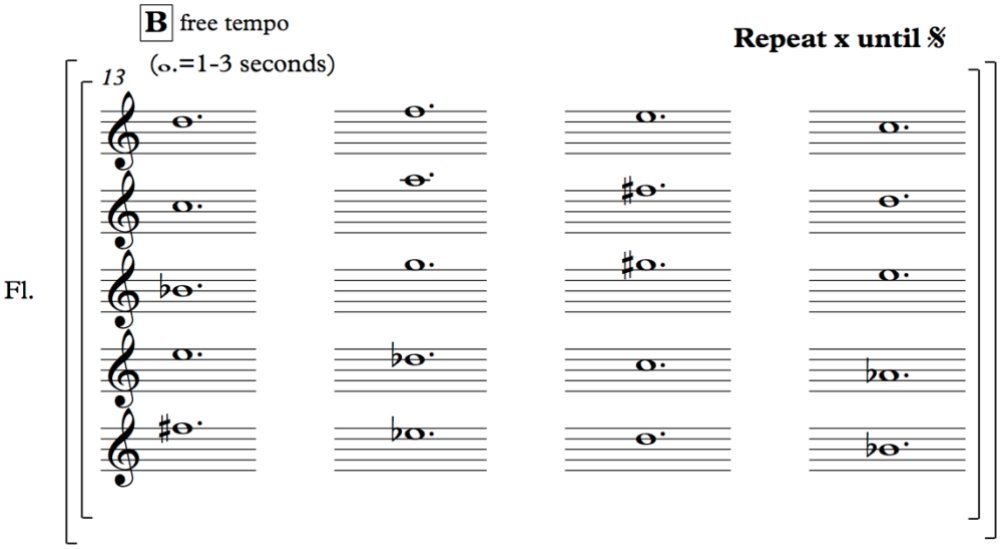

Figure 5.13 *High and Subtle*, part notation of module (bar 13)

In this section, I extended the *harmonic defining principle* I discussed in Section 5.1.3.3 concerning my saxophone solo. There, it defined a mode to be used in improvisation. Here, that concept is extended into a more complex musical environment and combined with real-time ensemble interaction. Instead of being

presented with a single mode as in the saxophone solo, in section **B** of *High and Subtle*, the performers are given a variable mode that they can transform at every repetition. Reading from left to right, they choose one note in one of the five systems and move on to the next note, either changing system or remaining in the same one. The variable mode is derived from five transpositions of the core cell of Figure 5.11 and randomly distributed among the five systems to maximise variation. Moving between systems, the ensemble produces a musical outcome in which the underlying cell is still recognisable. Tempo is free, so that the musicians apply variation also to tempo while repeating the module indefinitely. Only the marimba plays a fully composed line that embeds the same fundamental cell. By playing *a tempo,* the marimba creates a friction with the free-tempo sonic environment laid out by the rest of the ensemble.

Section **C** uses a similar principle. This time, the musicians choose among five transpositions of a melodic elaboration of the fundamental cell. Tempo is free so that variation is also applied to the temporal unfolding of the music. The marimba plays a solo line that incorporates the basic cell once again. I constructed this line through a combination of Bartók's polymodality (Vauclain 1981; Kárpáti 1989) and Forte's pitch class theory (Forte 1973).

In a paper on Béla Bartók's bi-modality, Constant Vauclan (1981) demonstrates how the Hungarian composer moved from the superimposition of two lines in different modes to a more complex and thorough adoption of bi-modality. Vauclan shows how in Bartók's *3rd string quartet*, and *Music for Strings, Percussion and Celesta*, the melodic movements of a modal line are divided among different instruments and passed on from one instrument to the other. Thus, the composer constructs bi-modality by interlocking various fragments of modes that he passes on among the instruments. Building on this technique, and on Allen Forte's concept of pitch class, I constructed a sort of diachronic polymodality that I derived from the interlocking of two transpositions of the basic cell transcribed in Figure 5.11. The melody played by the marimba contains two transpositions – usually a tritone apart – of the cell, as shown in Figure 5.14.

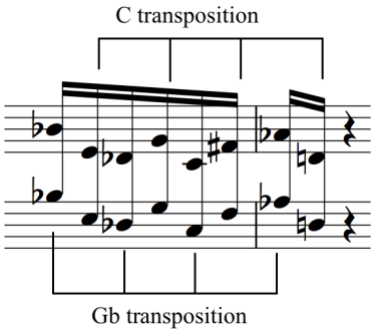

Figure 5.14 *High and Subtle*, marimba part, bars 46–47

The pitches are arranged so that from one note of transposition 1 of the cell, the successive note can be either the following pitch of the original cell in the same transposition, or a note of transposition 2. In Figure 5.14, I show the alternation of pitches of the two transpositions every other note. In Figure 5.15, the cell is instead embedded so that pitches 1, 2, 3 and 5 of this passage form the *D* transposition of the cell, whereas notes 4 and 6 are the last two pitches of the *G#* transposition.

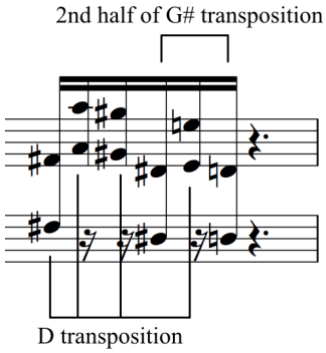

Figure 5.15 *High and Subtle*, marimba part, bar 53

The melodies played in section **E** by the flute and viola are constructed using the same principle, although interpolated with melodic fragments borrowed from the module played by the ensemble in section **C**.

From section **F**, almost all the musical materials deployed are melodic and rhythmic variations of the fundamental cell. In section **I**, the flute introduces a melody transcribed from a performance of the *sunata fina* by Erminio Mastroianni. This melody is present until the end of the piece and is split among flute, violin, viola and clarinet. The final section uses the alternation of V-I chords as in the original *sunata.* The cello plays a rhythmic figure that is more active in the harmonic area of the I and static in the area of the V. This is a feature that is found in the version of

fina for accordion and creates a special rhythmic and harmonic friction. The contrast created by the harmonic tension taking place on the rhythmic rest creates an almost suspended harmonic atmosphere, a characteristic of most music from Central Calabria (La Vena 2005; Ferlaino 2017).

5.2.1 Conclusion

As the *fina* is entirely constructed with a single musical element, so is *High and Subtle*. There, the balance between stability and variation is achieved in real time thanks to the extemporisation skills of the performers. Here, the performers are asked to flexibly engage with the musical materials and transform them in real time, by acting on determined parameters. In *High and Subtle*, the score takes the role of memory in the folk generative process. Through indeterminacy, framed improvisation and real-time variation, I try to recreate the constructive function of extemporisation. The parameters and instructions given and the practice developed throughout the rehearsals allow the performers to construct a musical discourse from partially-defined musical materials. At the same time, the variation and recombination of a small musical cell, responding to *economy of means,* is investigated in the fully composed part of the piece by drawing on the different techniques described in this section. *High and Subtle* was included in the *Reid and Red* programme and performed by the Glasgow-based *Red Note Ensemble* on May 13, 2017, at the Assembly Roxy in Edinburgh.

5.3 Creative investigation of bagpipe tuning

In Section 3.4, I discussed the tuning system and process of bagpipes. In that section, I demonstrated how tuning can be depicted as an arrowed process, a musical repertoire in which an unrationalised harmonic space is steered towards the order and rationalisation of the desired tuning system. From my analyses, a widely adopted microtonal system based on just intervals also emerged. Those studies opened a path for the creative investigation of pitch, extended harmonic space and microtonality. This section discusses how those studies informed the composition of three pieces: *No Dance Otherwise*, *Into the Pipe* and *Alla Berlinota*. All three explore

the shifting harmonic space experienced by the piper while tuning the instrument and adopt the arrowed tuning process described earlier.

I conducted the creative research on bagpipe tuning in three stages that spanned over more than two years. The first stage of the study led to the composition of a study for string quartet titled *No Dance Otherwise*. With continuous, uninterrupted sounds, this piece reproduces a shifting disordered harmonic space that slowly resolves towards quantised pitch relationships.

A second stage led to the composition of *Into the Pipe*. This composition extended the explorations with a shifting harmonic space to improvisation and ensemble interaction. The piece is written for an improvising saxophone quartet, as it relies on the creative contribution of the performers. *Into the Pipe* is divided into two movements, the first of which is informed by the tuning process, and the second by the dance repertoire for bagpipes.

I conducted the last stage of the enquiry into pitch and tuning as a visiting researcher in Berlin under the supervision of Marc Sabat, just intonation composer and scholar in intonation theory. The work resulted in a series of studies for just intonation and a composition titled *Alla Berlinota.* In this piece, the harmonic ratios described in my analysis of the *surdulina* are explored in the context of just intonation music for string quartet.

In this pages, I use terms such as ‘harmony’ and ‘harmonic space’ as synonyms of John Cage’s *sound-space*: a sonic environment that is “ear-determined only” and in which every sound and combination of sounds is possible (Cage 1961a). The approach to harmony that I use in these pages is derived from that of James Tenney (2014); ‘harmonic space’ refers to the vertical correlations of sounds and the intervallic relationships among simultaneous pitches, regardless of their internal hierarchical structuring and free from their tonal relationships.

5.3.1 *No Dance Otherwise*

In Section 3.4, I demonstrated how the tuning system and process of bagpipes are informed culturally. In those pages, I also described the tuning process as a musical repertoire with an arrowed form. The Calabrian tuning repertoire became the fundamental concept of a composition for string quartet, in which I experimented with tuning in a constantly shifting harmonic space. In *No Dance Otherwise*, a

disordered, non-rationalised harmonic space is slowly directed towards a quantised order, thus reproducing the arrowed form of bagpipes' tuning process.

In experimenting with a disordered harmonic space in which all frequencies are possible, I needed to work with instruments that could easily reproduce non-quantised pitches. Hence, I started this part of my creative research with a study for string quartet. The bowed instruments also allowed me to experiment with such an extended harmonic space in an uninterrupted sound environment, a fundamental sonic attribute of bagpipes.

The string quartet is probably the only "classical" setup that survived throughout the 20th century (Toop 2014), resisting even the post-war European avant-garde's rejection of traditional genres and forms. Its prestige, "pedigree and […] emblematic hard-core status […] made it a continuing touchstone even for the young radicals" (Toop 2014, 318). Composers from different schools and nationalities have experimented, and keep experimenting, with this setup (Grella-Możejko and Ozipko 2013; Mazzolini 2013; Fox 2014). Its status remained unvaried even in the most experimental approaches, whereas other historically consolidated instrumental combinations lost their prestige (Cassidy 2013). According to Aaron Cassidy, the reasons can be found in the quartet being:

> A place for new materials, new methods and new approaches to form (and to perception, listening and memory), new techniques, new notations, a certain sense of experimentation or risk;[...] a place for refinement or sophistication, often with an impression of summation, a sense that earlier experiments have congealed and materials may be more clearly articulated (Cassidy 2013, 306).

The intrinsic equality of parts offers a greater variety of texture compared to classical orchestras, "where the relative importances of the instrumental departments were more firmly fixed" (Griffiths 1985, 42). Especially in relation to this last quality, the string quartet seemed to me to precisely reproduce the equal sonic balance of the four pipes of a *surdulina*. In the bagpipe, despite the fact that only two of the chanters are assigned a melodic/rhythmic function, all the sounding pipes have equal importance. The music produced is the result of melodic, rhythmic and harmonic relationships among the four pipes. Because of the equality of its parts, together with the possibility of providing continuous and uninterrupted sound formations, the ability to explore non-quantised harmonic space, and the traditionally experimental nature of such an instrumental setup, the string quartet seemed the perfect testbed for my ideas.

Working with an ever-changing pitch in a continuous, uninterrupted sound environment resulted in the use of glissandi as fundamental technique. Composers have used glissandi widely as effects or for their gestural value (Cassidy 2013). I was, instead, more interested in glissandi as a tool for exploring pitch relationships and harmonic space, similarly to the way James Tenney used them in some compositions for string instruments. These types of harmonic explorations can be found in his *Postal Pieces* – mainly in *Koan* and even more in *Cellogram* (Tenney 1971) – as well as in *Koan's* version for string quartet (Tenney 1984). In those pieces, the underlying ideas are mainly "intonation" and the "unadorned use of musical structures which will produce meditative perceptual space" (Polansky 1983, 193). Disciples of Tenney have also expanded on this approach to glissandi: Chiyoko Szlavnics, for instance, extensively explored ever-changing harmonic spaces through continuous glissando movements. Tenney's *Postal Pieces* and the work of Chiyoko Szlavnics, such as *Gradients of Details* (2006), were a constant reference while writing *No Dance Otherwise*. I applied my investigations of bagpipe tuning to the exploration of the intervallic relationships within the four instruments in a constantly moving, non-quantised harmonic space. The focus here is on the "micro-tuning in the string playing", on the "acoustical phenomena", the "moment-to-moment sound" (Lucier 2012, 194). The meditative state of mind, induced in the piper by the continuous sound of the instrument and the blowing effort, accentuated in the tuning process by the attentive and constant evaluation of the harmonic relationships, shifted, in my composition, to the creation of a meditative perceptual space for the listener. In such a rather slow-moving exploration of the harmonic space, the listener is invited to contemplate the different intervallic relationships experienced throughout the piece.

While composing *No Dance Otherwise*, I faced some notation issues due to the use of very slow glissandi over a limited interval range – usually a tone or a semitone. Writing a 10–15 seconds semitone glissando in traditional notation would have made life difficult for the performers, if not completely jeopardising the readability of the piece, especially in passages where such glissandi would interlock across the four instruments. In order to ease the readability, I opted for a mixed notation and added a second staff above the traditional five-line staff of each instrument, as shown in Figure 5.16. This extra staff has three lines which refer to pitch variations in the order of a quarter-tone, expressed in cents. The central line indicates no change to the pitch written in the bottom line – 0 cents; the upper line

indicates a pitch increase of 50 cents; conversely, the lower one prescribes a 50 cents pitch decrease. Ledger lines, each one prescribing a variation of 50 cents, are added when needed.

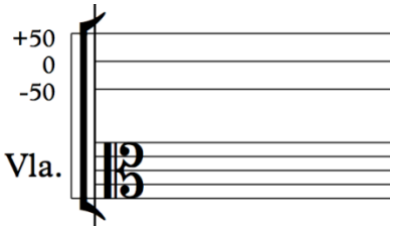

Figure 5.16 *No Dance Otherwise*, staff system

A continuous bold line in the top staff indicates the pitch variation that the performer is required to apply to the note written in the bottom one. When a full semitone slide occurs, the line goes gradually down to -50; it is broken and continues sliding down from +50 while a simultaneous note change occurs in the lower staff. Then, the line continues its slide towards the 0 of the target note – see Figure 5.17.

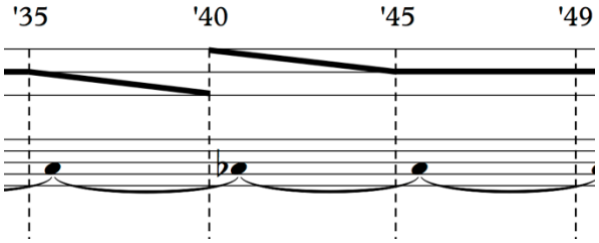

Figure 5.17 *No Dance Otherwise*, semitone slide

Tempo is notated in seconds at the top of the system; a dashed vertical bar-line marks the moments in which pitch changes start or end. Consequently, the pitches are all expressed with black, stem-less notation.

In working with a relatively undetermined harmonic space, I decided to leave some margins of interpretation to the performers. Instead of fully adopting a traditional notation and define well-determined pitch heights, I decided to use the notation described above, since it leaves open margins for indeterminacy, albeit minimally.

Concerning timbre, the players are asked to play *sul ponte* on lower strings in order to produce a sharper sound, which may recall some of the harshness of the bagpipes.

The instruments work in total autonomy: no rhythmical interlocking, phrases or lines go across the four strings. Yet, the instruments' independence makes sense

only in the constant intervallic interactions occurring between them. They do not function as four solos glued together but rather as a combination of four independent lines whose significance is appreciable only in relationship with the whole.

5.3.2 *Into the Pipe*

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I extended the experimentations with arrowed forms, moving from a disordered to an ordered harmonic space, and the frequency clashes of *No Dance Otherwise*, in a composition for saxophone quartet whose title is *Into the Pipe*.

The saxophone quartet reflects, to some extent, some of the instances which made the string quartet a preferential setup for experimentations, such as the equality of parts and its capacity to enable textural explorations. As for the string quartet in *No Dance Otherwise*, working on a saxophone quartet would allow reproducing the equal sonic balance of the *surdulina's* chanters. Furthermore, it would reinforce the link with the bagpipes by maintaining continuity with its sound production medium: the saxophone quartet, with its four single-reed instruments, would reflect the four single-reed chanters of the bagpipe.

Saxophone ensembles can be traced back to the origin of the instrument itself (Plugge 2004). Adolphe Sax himself promoted the introduction of the instrument in various institutions such as civilian and military bands, and hosted in his publishing house, Chez Adolphe Sax, many compositions for saxophone ensembles by various composers (Plugge 2004). The genre and in particular the quartet developed quickly both in France and in the United States – also thanks to the significant contribution by John Philip Sousa and his Marine Band as well as the vaudeville genre (Plugge 2004). Saxophone ensembles continued to thrive also within jazz and improvised music. In fact, saxophone quartets and saxophone ensembles have become a standard setup for the post-Coleman improvisers. Quartets, quintets and sextets have become a platform for musical experimentation. Although their status and prestige are not comparable to that of the string quartet, the sonic potential of saxophone ensembles has been widely explored by improvisers and experimentalists during the past 40 years. A few examples include Anthony Braxton (2011b; 2013; 1989), Julius Hemphill (1991; 1993), Alvin Curran (1990), the World

Saxophone Quartet and ROVA Saxophone Quartet – the last two with a substantial discography, each numbering over 20 titles.

With *Into the Pipe,* I wanted to work more extensively on bagpipe repertoire. I planned to compose a piece which featured at least two elements of bagpipe music. The result is a two-movement composition which could reproduce the structure of a performance for bagpipes, thus featuring tuning and dance. The first movement is an extension of the tuning concept explored in *No Dance Otherwise*; the second is a work on the dance music vocabulary for bagpipes.

I wrote this piece for an improvising saxophone quartet. Working with improvisers allowed me to keep some indeterminate elements in reproducing the arrowed tuning process. Improvisation and indeterminacy bring variation into play, somehow mirroring the different, random sets of pitches that the pipers are faced with each time they start the tuning process.

In order to maintain a balance between the fulfilment of the arrowed motion and the unpredictable results of improvisation, I devised a notation system which encloses improvisation within a framework that reproduced the concepts used in *No Dance Otherwise*. In that composition for string quartet, the notation left very little space, if any, for the performers' creative contribution. By working with four improvising saxophone players, I knew I could rely on their aural skills and their interplay. Thus, I defined a series of interval ranges within which each improviser could freely choose pitches according to a set of verbal instructions.

Into the Pipe starts with a traditionally notated 16-measure musical period. This introduction lays down a clustered harmonic environment which works as a sonic reference for the improvisers. From bar 17, the interval ranges appear; they are notated with a boxed bichord, as shown in Figure 5.18. The pitch choice is confined within the defined ranges and bound to the verbal instruction that requests the ensemble to maximise interval clashes and clusters. These clashes can be achieved freely through tempered and non-tempered pitches; the latter produced both through microtonal fingerings and embouchure detuning at the choice of the players. The four musicians are asked to actively rely on their listening and interplay skills to create an ever-changing disordered harmonic space.

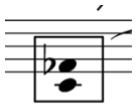

Figure 5.18 *Into the Pipe*, interval range notation

Tempo is free as well as duration: dashed arrows indicate the sequence in which instruments follow each other, see Figure 5.19. The four musicians can indulge in the improvisations ad libitum and allow themselves as much time as needed to explore the harmonic relationships that result from the improvised combination of pitches. The four saxophonists queue their position in the sequence of interval ranges, thus allowing the whole group to easily follow the score. Each sequence ends with a fully notated chord with a fermata.

The form of the first movement – *Tuning* – is based on a succession of short sequences with an arrowed harmonic direction pointing from disorder to order. In each bar, the tension of the improvised clusters is resolved in fully notated chords. The form of these short sequences mirrors, in the microscopic, the arrowed form which characterises the whole movement.

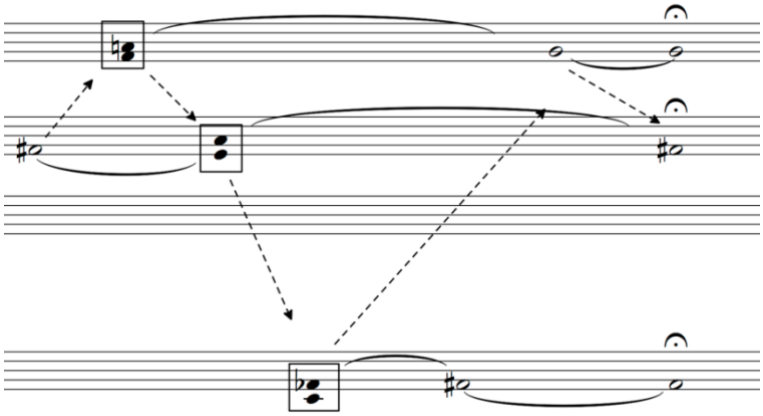

Figure 5.19 *Into the Pipe*, bar 18

The second movement – *Dance* – explores variation and iteration of a short musical cell. This part is based on a *girata* I transcribed from a dance *sunata* for bagpipes. The choice fell on a short and simple module performed by Vittorio Mendicino and recorded by Vincenzo La Vena (2005) and myself (Ferlaino 2017). The written element lasts two bars, and it has to be repeated indefinitely. It is accompanied by a series of instructions that prescribe the variation of the module, mostly regarding tempo and pitch. Despite being traditionally notated, the module works in a flexible way, as an abstraction of the variation processes described in Calabrian music. In my analyses of folk music, I described the endless melodic/rhythmic variation through repetition of a module according to a process that is informed both by memory and by real-time agency. A similar process is set into motion in the second movement of *Into the Pipe*. The written element works as

a binding musical object which has to be approached creatively by the musicians in real time. In the case of bagpipe music, the module is transformed melodically and rhythmically, but its duration is kept unvaried. In the case of *Into the Pipe*, I opted for a freer approach. Variations happen both in pitch and tempo, through a series of instructions given by the score, whereas the rhythm stays unchanged. The instructions are the following:

1. Random pitch – individual tempo (repeat x)
2. Read as is – individual tempo (repeat x)
3. Random pitch – land on the long, written F (repeat x)
4. Random pitch in a chromatic 5th range – land on the long, written F (repeat x)
5. Random pitch in a diatonic 5th range – land on the long, written F (repeat x)
6. Random pitch – same tempo (repeat x)
7. Read as is, alternate with random pitches – same tempo (x 3)
8. Read as is – same tempo (x2); end on long F unison

The four improvisers choose their pitches freely, according to the given instructions. They choose their tempo individually playing the lines in relative independence although interacting through interplay. The effect is a contracting and expanding musical space in which different lines interlock freely. Towards the end, the players are bound to the same tempo. One of the performers cues the change from one instruction to the next.

This part was informed, to some extent, by the strategies that Anthony Braxton used in his *Composition 67* (1992; 2011a). Braxton's composition is based on four short cells written over a diatonic hexachord. The performers choose what cell to play and act on the music material, accordingly with the provided instructions, on pitch, tempo and contour. In *Composition 67* the procedures were meant to move away from the prescribed material. In the second movement of *Into the Pipe*, the form moves from randomised pitch and tempo to the written music element which ends the piece, reproducing once again the motion from disordered to ordered pitch described in *No Dance Otherwise*.

I wrote this piece for the Solaris Saxophone Quartet, an ensemble of which I am part, and that features composers and improvisers from different backgrounds based in Amsterdam. *Into the Pipe* was premiered on 20 June 2016 at Salon de IJzerstaven in Amsterdam. The piece has since been performed many times and by

different quartets. On 24 August 2018 it was performed by members of the Ostravská Banda at Ostrava Days.

5.3.3 *Alla Berlinota*

In my analyses of bagpipe tuning in Section 3.4, I described a microtonal system based on simple harmonic ratios according to which Calabrian bagpipers tune their instruments. As I was unfamiliar with microtonality, in order to complete this part of research, I had to gain knowledge and develop skills in this field. Thus, I applied for a Visiting Researcher Scheme at Universität der Künste in Berlin, to work and study with Marc Sabat, composer of just intonation music and scholar in intonation theory. In Berlin, I perfected my analyses of the tuning of *surduline*, studied the theory of intonation, analysed just intonation compositions, and researched different tuning systems. My research was also concerned with acquiring skills in aurally recognising the sound of just intervals. I participated in the Experimental Orchestra held by Marc Sabat weekly at the UdK. The sessions were concerned with acquiring empirical knowledge of the quality of the different intervals through ear-training exercises and theoretical investigations, and by tuning the harpsichord and performing just intonation music. The meetings aimed at discerning the special *fusion* quality of various intervals. *Fusion* refers to the perception of the periodicity of a harmonic interval; it defines the moment in perception where beatings are no longer heard, and the interval is perceived as a unit (Sabat and Hayward 2006). Fusion is characteristic of *just* intervals and it results from the mathematical relationship in the intervals' periodicities. The concept of fusion also helps to describe how pipers aurally evaluate the tuning of their instruments, as I discussed in Section 0. The outcome of this phase of my research was a piece titled *Alla Berlinota*, for string quartet, that explores the microtonal setting of *surduline* bagpipes.

Intonation has been an object of study for composers and theorists throughout the whole history of Western music. Studies date as back as the 6th century BC when Pythagoras developed a tuning system, based on pure fifths, that influenced Western music for centuries. Studies in tuning continued throughout the centuries, with a renewed interest in the Renaissance by musicians and theorists such as Gioseffo Zarlino, Pietro Aaron and Giuseppe Tartini. Those investigations often involved the development of new musical instruments. For instance, Nicola

Vicentino developed the *archicembalo* and the *arciorgano*, keyboard instruments with split keys that were able to reproduce different tunings and allowed modulation in various keys. Research into tuning also continued after the advent of the tempered system (Azzaroni 1997); in the 20th century, composers thoroughly investigated the possibilities offered by microtonality and extended tuning. Henry Cowell studied the harmonic relationships of intervals derived from the harmonic series (Cowell and Nicholls 1996). Harry Parch developed music instruments that are tuned according to various systems based on just intervals. Adopting just tuned ratios, he also devised a scale that divides the octave into 43 parts. (Sabat 2004). Julian Carrillo composed music based on 16 equal subdivisions of the tempered tone. John Cage envisaged an extended harmonic space in which every sound and interval is possible (Cage 1961). Building on Cage's approach, James Tenney proposes a new theory of harmony in his last, unfinished writing (Tenney 2014).

Just intonation and microtonal composers have also explored ways of notating music that deviates from 12-tone equal temperament. Equal deviations, such as quarter-tone and eighth-tone, are a common practice although many different sets of alteration signs have been used. Mexican composer Julian Carrillo devised a notation system that uses a single-line staff and numbers. This system allowed him to subdivide the octave into equal fragments as small as a sixteenth of a tone, as can be seen in compositions such as *Preludio a Cristobal Cólon* (1944). To notate non-equal deviations, composers have resorted to different resources. One of the most common is to notate the deviation in cents from the corresponding tempered pitch. To notate music based on interval ratios, composers such as James Tenney indicate the harmonic relationships between the written tones by defining their position on a common harmonic series. In the string quartet version of *Koan* (1984), he uses only traditional alterations and notates the harmonic relationships between pitches, the deviation in cents of each pitch from the corresponding tempered note, as well as the width in cents of each harmonic interval.

Alla Berlinota explores the harmonic relationships produced by *surduline* bagpipes in a setting for string quartet, combining them with elements of the bagpipe repertoire. The piece is entirely constructed with the simple ratios described in my analyses of bagpipe tuning in Section 0. Figure 3.42 transcribed the harmonic relationships of the notes of a *surdulina* in reference to the harmonic series. The chords I used in *Alla Berlinota* are all derived from those harmonic relationships – mostly based on pure thirds, fifths, sevenths and ninths – and all tuneable by ear.

Pitches are notated with the *Helmholtz–Ellis Just Intonation Pitch Notation* (Sabat 2009), a system that codifies and simplifies the notation of just intervals. This system was designed by Marc Sabat and Wolfgang von Schweinitz and expands on signs devised by Hermann von Helmholtz (Helmholtz 1875) and Giuseppe Tartini. The basic assumption is that non-altered notes are tuned according to the Pythagorean tuning system, hence by pure fifths. Consequently, the accidentals refer to a prescribed deviation from the Pythagorean tuning of the notated pitch. By adopting as building blocks the prime numbers 3, 5, 7, 11 and 13 of the harmonic series, the Helmholtz–Ellis notation defines a system that is readily understandable. In *Alla Berlinota*, the instruments are tuned by pure fifths (702c) with A=440 Hz, as shown in Figure 5.20.

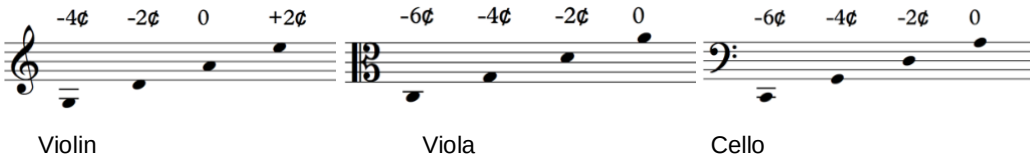

Figure 5.20 Tuning of the open strings in *Alla Berlinota*

The first part of the piece expands on the tuning process I adopted in the composition of *Into the Pipe* and *No Dance Otherwise*. The tuning process is explored here through a range of just intervals within which the performers choose their pitches freely so as to contrapose effects of *fusion* to non-quantised relations. The boxed notation I adopted in *Into the Pipe* is exploded, in this piece, into a two-line staff, as shown in Figure 5.21. The two ends of the interval sit on the lines, whereas an indeterminate harmonic space sits in between.

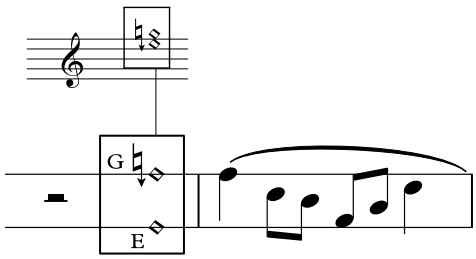

Figure 5.21 Notation system of *Alla Berlinota*

I transcribed the rhythmic figures I used in this part from a piece for bagpipes, as I wanted to combine the tuning process with musical elements of the repertoire functional to grazing (La Vena 2005). This repertoire is very common in Northern and Central Calabria and is referred to with a variety of names – for instance, *scođđa timpuni*, or *sbucca serra* – all describing the act of walking across the fields

among the flocks. This slow-paced repertoire offered a suitable rhythmic ground for combining the tuning process with more strictly notated figurations. The performers follow the directions of the “melodic lines”, freely choosing their pitches within the prescribed interval. This technique also allows for introducing an element of *micro-variation* into the piece. This time, *micro-variation* acts at a microtonal level so that each performance of the piece sounds alike although every time slightly different.

The tuning section is followed by a chorale in which the harmonic relationships are explored with slow-moving lines and chords. This part explores harmonies that can be produced on *surdulina* bagpipes in a harmonic space that is constantly shifting through harmonic modulations. Each chord is constructed with partials of a common harmonic series. The lines are constructed so that notes in common to successive chords sit in different positions in the harmonic series from which the chords are constructed. Figure 5.22 shows an example of this technique. Numbers, read vertically, indicate the position of each note in a harmonic series common to the other notes of the chord.

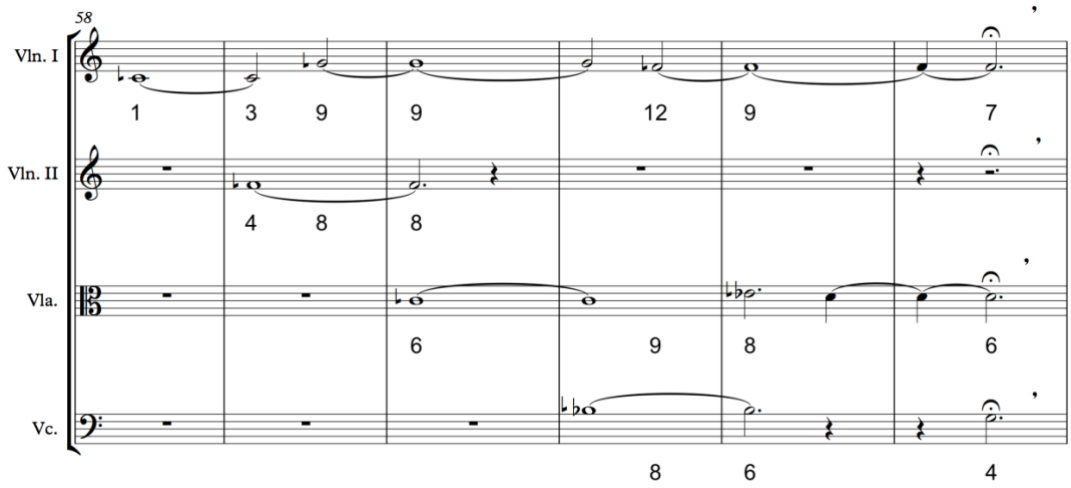

Figure 5.22 Harmonic relations of common notes in *Alla Berlinota*

For instance, the *F* lowered by a septimal comma in bar 59–60 is initially perceived as the fundamental of a harmonic series on which both *C* (its fifth) and *G* (its ninth) – both lowered by a septimal comma – sit. The appearance of a *Bb* (septimal comma down) in the cello part in bar 61 makes *F* become the fifth of the harmonic series of *Bb*. In bar 62, *F* becomes, instead, harmonic 9 of a series constructed on *Eb* a septimal comma down. With the appearance of the unaltered *D* and eventually *G*, *F* becomes the seventh (partial n.7) of the harmonic series of *G*. The shifting fundamentals produce the perception of a modulating harmonic space:

conglomerates of pitches are, thus, defined by their relationship with common fundamentals in the harmonic series. By adopting this expedient, the chorale explores the harmonies of the *surdulina* bagpipes in a constantly changing harmonic space.

The last part of the composition expands on the harmonies of the first bars of the chorale. Here, the harmonic explorations are extended with interweaving lines. Open fifths are explored through extended techniques in the opening part of episode three. Afterwards, the harmonies are explored through a counterpoint of continuously interweaving lines with a folkish character. In this part I attempted to reproduce the interweaving of the melodic lines of *surduline* without overtly resorting to elements of the instrument's vocabulary.

5.3.4 Conclusion

The three compositions described in the preceding sections are the result of my creative exploration of bagpipes' tuning. The arrowed process of the tuning repertoire was translated into a motion from a disordered harmonic space to an ordered one. The process was achieved with determined composition in *No Dance Otherwise*, indeterminacy in *Alla Berlinota*, and improvisation in *Into the Pipe*. Pipers' listen attentively to interval relations in their instruments in order to achieve the desired tuning. They experience the shifting harmonic space while they steer the instruments' pitches towards the desired tuning. The three pieces described here invite the listeners to listen to similarly shifting harmonic space and intervallic relationships in order to experience their perceptual response to the fluctuating harmonies. The shifting harmonic spaces are explored here in a quartet setting, as a reference to the four pipes of the *surdulina.* However, these investigations are potentially valid for every instrumental setting, from smaller ensembles to orchestra.

The pieces also explored different approaches to variation in modularity, from the free pitches of *Into the Pipe* to the microtonal variations of the first part of *Alla Berlinota.* Also, elements of the bagpipe repertoire are explored, from dance music to music functional to grazing. New investigations will build on the work done and explore these features of Calabrian bagpipes in new settings.

5.4 Bells and soundscapes: *All'erva Radicchia*

A mock-up version of this piece is located in */Media/All'erva_radicchia_mockup*

In Section 3.5, I described an approach to sound that allows shepherds to reconstruct a detailed representation of space and enables a complex network of relationships between humans, landscape and animals. By following the sound of an animal's bell through space, shepherds receive detailed information about its position, state and activity. I also pointed out the aesthetic value of bells and of the flock's sound. Shepherds look for specific characteristics in the sound of their bells and carefully tune their flock to produce a pleasurable harmony. The studies I conducted on Calabrian soundscapes and bells became the foundation of a composition entitled *All'erva Radicchia*. This piece is written for 6 to 23 animal bells, whose tuning is described in Figure 5.23. The composition is mainly informed by the use of bells in goat flocks, for the complexity of harmonies and the rich sonic environment they shape. I was struck by the complex personalities that goats exhibit and how these reflect in the sound produced by the flock. I was also fascinated by how animals with similar behaviours receive a same sound, thus enriching the already composite counterpoints of the flock.

Label	Tuning	Quantity
A	B6 -9	x1
B	E6 -30	x3
C	B5 +9	x1
D	A#5 +34	x3
E	A#5 -37	x1
F	G#5 +23	x3

Label	Tuning	Quantity
G	F5 -3	x2
H	E5 +10	x2
I	D5 +26	x2
J	C5 -2	x2
K	B4 +19	x1
L	G#4 -5	x2

Figure 5.23 *All'erva Radicchia*, bells and relative tuning

The minimum number of performers required for this piece is six. According to the chosen number of performers, each musician is assigned one bell by following the instructions shown in Figure 5.24.

Performer number	Bell
Performer 1	B
Performer 2	C
Performer 3	D
Performer 4	F
Performer 5	H
Performer 6	K
Performer 7	L
Performer 8	A
Performer 9	I
Performer 10	J
Performer 11	G
Performer 12	E

Performer number	Bell
Performer 13	B
Performer 14	F
Performer 15	H
Performer 16	J
Performer 17	I
Performer 18	D
Performer 19	G
Performer 20	L
Performer 21	B
Performer 22	D
Performer 23	F

Figure 5.24 *All'Erva Radicchia*, bells assigned to performers

The piece revolves mainly around two aspects that emerged in research: spatial representation and the unpredictability of the animals' behaviour. On one hand, I wanted to recreate the aural networks initiated by the sound of bells by writing a piece in which the listeners recognise and follow the bells as they move through space. This way, I would reproduce, in the performance space, the rich soundscapes designed by bells in Calabria. On the other hand, I wanted each specific sound to design unpredictable paths, so as to reproduce the wandering of the animals in a flock. In my piece, spatial representation and unpredictability translated into spatialisation and indeterminacy.

The relationship between music and space is commonly believed to have emerged from recent developments of performance art. However, this relationship dates back to a remote past. An example could be found in the use of *cori spezzati*, and the displacement of the musicians within St. Mark's Basilica in Venice in Adrian Willaert's and Giovanni Gabrieli's music (Gagné 2012). Howard and Moretti even hypothesise a relationship between the development of compositional techniques and the spatial and acoustical ambience of Italian Renaissance architecture (Howard and Moretti 2009). Mahler's *Symphony n.2* and Verdi's *Requiem* used offstage ensembles (Gagné 2012). The exploration of the relationship between music and space has known new vitality from the 20th century, first in instrumental music, then with performance and installation art. Britten's *War Requiem* (1961–1962) included an offstage choir; Berio's *Circles* (1960) contains detailed stage

directions for the performers; in Boulez's *Domaines* (1968), a clarinettist is free to wander between six ensembles.

The spatialisation of sound in performance can be understood in various ways: the environment in which music is performed; where the players are positioned in that space; and how the audience is placed in respect to the sound source (Rogers 2013). The examples mentioned earlier are mostly concerned with exploring the first two approaches. However, in the 20th century, composers also questioned the traditional division of the conventional concert space into two separated areas, namely the "performing space" and the "listening space" (Blesser 2007). Some experimented with locating the performers within or around the space of reception. In Xenakis's *Terretektorh* (1966) the orchestra is scattered through the audience; in *Persephassa* (1969), the six percussionists surround it. In Ligeti's *Le Grand Macabre* (1974–1977), members of the choir are disguised among the audience. Stockhausen explored the relationship between space and music to an extreme extent with *Helikopter-Streichquartett* (1992-1993), in which the instruments fly over the performance space in four helicopters.

The spatial arrangements of *All'erva Radicchia* require the music to be distributed among nine stations place around and within the audience according to the stage plan shown in figure Figure 5.25. The whole composition is printed on nine pages and each station is supplied with only one of the pages. The performers walk through the performance space and move from one station to the other, following a path that is established beforehand. The audience, placed in the performance space, can be seated, stand or move around as long as the performers are not impeded to walk along the pathways. This spatial arrangement allows the audience members to experience the sound of the bells coming from different directions, and to recognise the path and position of each bell by following its sound as it moves through space. Through these expedients, I attempt to reconstruct the aural networks that emerged in my research on animal bells in Calabria.

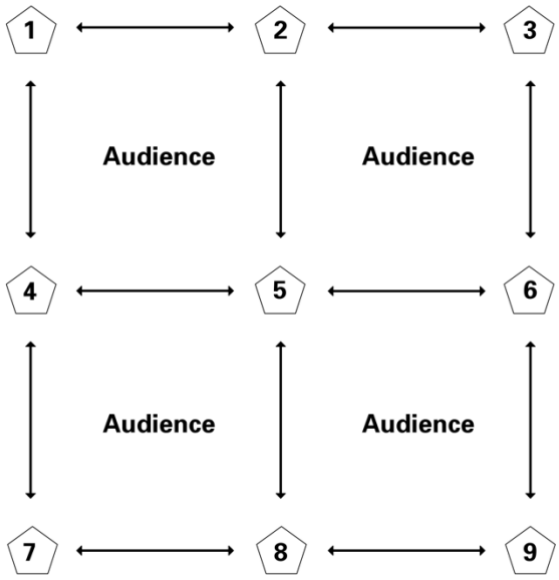

Figure 5.25 *All'erva Radicchia*, stage plan

I attempted to reproduce the unpredictability of the animals' behaviour by introducing elements of indeterminacy at different levels of the composition. John Cage (1961b) defines indeterminacy as an absence of linearity between the work of the composer and its outcome in performance. Jennie Gottschalk (2016) identifies it in the "openness of the end result", whereas Paul Griffiths (2010) talks of mobile forms. The three definitions agree on the open character of indeterminate music, whose outcomes are partially or completely unexpected. Indeterminacy may be applied to many different levels of the composition: to the choice of musical materials, the structural arrangement of the piece, the sequence of notes or the performance outcomes. John Cage's *Music of Changes* (1951) may be taken as an example of indeterminacy that operates at the composition level: in this piece, the musical materials are defined by chance operations derived from the Chinese divination text *I Ching*. Stockhausen's *Klavierstück XI* (1956) presents the player with 19 different segments of music notated on a single large sheet of paper. The performers are asked to freely build their own path through the segments. Thus, the structure of the piece is indeterminate and changes at each performance while the musical materials presented to the performer are stable. Feldman's *Intersection 3* (1953) presents a determined structure made of indeterminate musical materials, by shifting the attention from notated pitches to gestural instructions. Earle Brown's *4 Systems* (1954), written on a graphic score that can be performed "either side up", presents the musician(s) with indeterminate music materials and structure. Hence,

Earle Brown's music provides for "permanent mobility" from one performance to another by attributing the performer an active role in giving the music form (Nyman 1999).

In my composition, indeterminacy operates at different levels. However, I aimed to limit the openness of the musical outcome so that the piece would maintain a rather stable and recognisable character. A limited variability in the outcomes would also recreate the deep interrelation between stable and mobile elements in Calabrian music that I discussed in Section 3.3. I also wanted to maintain some control on the musical outcomes and act as a shepherd who keeps track of the flock.

I composed this piece through chance operations defined by two dice. One die determined note duration while the other defined the type of toll required to activate the bell. However, the composition process also reflects the search for an interrelation between stability and mobility by combining controlled compositional techniques with indeterminate ones. In fact, I composed only half of the piece through dice. The other half was obtained by retrograde so as to produce a coherent form that may contain recognisable features throughout. However, the listeners do not perceive the palindrome form as it is concealed by the simultaneous performance of the nine pages and by other elements of indeterminacy. The music is printed on nine unnumbered square sheets so that the order in which a page is assigned to a station is chosen randomly and may vary at every performance. This expedient introduces a formal and spatial element of indeterminacy.

The notation system is composed of the three symmetric symbols shown in Figure 5.26. The symbols – a square, a four-pointed star and a circle – remain unchanged regardless of the side on which the page is laid. The composition is printed on square-shaped paper and contains ten lines, each lasting 10 seconds, that must be read from left to right. Therefore, each page of the composition can be read in four different ways, depending on which edge the paper is laid on.

Figure 5.26 *All'erva Radicchia*, notation system

The fixity of the text is transformed at each performance by chance operations resulting from the random distribution of pages among the stations and the edge they are laid on. One more element of controlled indeterminacy is introduced by the

notation system. In fact, the symbols prescribe an action rather than the expected sonic outcome: each sign refers to a way of activating the bell. The performers are asked to hold the bells from the handle, vertically along their body. The performer's arm must be fully stretched and relaxed so that the sound is produced only by moving the wrist. Performers should not hold the handle too tightly in order to let the bell ring freely. The signs refer to three movements, as described in Figure 5.27: the star asks for a side movement of the wrist, so that the beater hits the wide part of the bell's body; the square asks for moving the wrist back and forth once, so that the beater hits the narrow side of the bell's body; the circle asks for a circular movement of the wrist so that the beater rotates around the bell's opening. These movements produce a relatively controlled outcome: sometimes the beater strikes the bell only once; other times it hits the bell more than once. They also limit control on the clarity and the loudness of the sound produced, which may change at each strike.

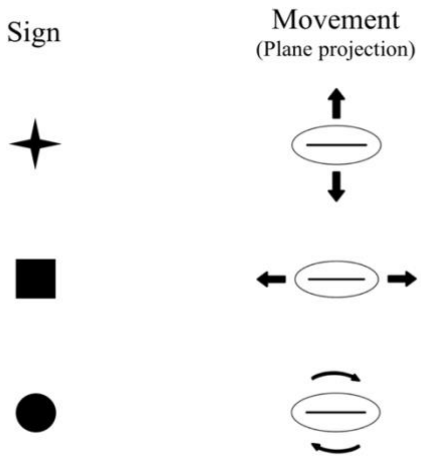

Figure 5.27 *All'erva Radicchia*, signs and corresponding wrist movement

Containing ten lines, each lasting ten seconds, each page lasts one minute and forty seconds. However, to prevent a sequacious execution of the music I avoided specifying a defined timeline. Through this expedient, I introduce elements of variation also in the way performers interpret the score. Each time the same line may sound slightly different, although it still preserves a definite and recognisable character.

Chance operations also determine the structure of the performance. The performers are required to define their path through the stations before the performance. They do so by tossing a 12-sided die. Numbers 1–9 of the 12-sided

die correspond to station numbers; 10 prescribes a 30-second rest; 11 prescribes a 1-minute rest; 12 prescribes a 1 minute and 30 seconds rest. The performance duration is indeterminately open, although a minimum duration is required to be determined by seven rolls of the die. Each performer rolls the die the agreed number of times: each player then follows the path and observes the silence defined beforehand.

All the described expedients make it possible for the music to change at each performance, although it maintains a clearly recognisable character. The musical materials preserve an intrinsic structural unity that is transformed each time through indeterminacy methods.

At the beginning, all the performers enter the space and move slowly towards their first assigned station. When reaching the designated station, the performers must start to play without waiting for the others to be in place; they do not begin in sync with each other. The performers choose their way to the next station freely, following the directions given in the stage plan. The content of a page is read in one uninterrupted sequence. Music is performed without a stopwatch; performers are asked to keep track of the time by silently counting series of 10 seconds. When finished with playing a page, a performer moves slowly to the next designated station: moving between stations should last between 10 and 30 seconds. While walking between stations, the bell should not be muted, so that if a toll is given by accident, the bell must be free to ring. However, the performers should not intentionally ring the bell during the transitions.

5.4.1 Conclusion

The composition process spanned over a year, from March 2016 to September 2017. Decisive for the composition of this piece was my participation in the summer workshops and festival Ostrava Days where I was introduced to the music of Rudolf Komorous. In particular his *Preludes* (1974) for 13 early instruments, written for non-professional musicians, played a fundamental role in defining my choice for the notation system I developed for *All'Erva Radicchia*. I was fascinated by the simple and intuitive visual instructions through which the Canadian composer delivers complex musical information. Inspired by Komorous' work, *All'Erva Radicchia* can be performed regardless of musical training or experience and is accessible both to professional and non-professional musicians.

A similar decisive role was played by the composition of the live soundtrack for Lorenza Mazzetti's movie *Together* (1956). This piece was commissioned by HippFest, Festival of Silent Movies in Bo'ness, to Prof. Raymond MacDonald and myself. Fascinated by the evocative power of animal bells, we decided to adopt them as one of the recurring themes of the soundtrack, thus making the film the testbed for my successive experimentations with bells. In the various performances, the audience positively received the evocative sound of bells, giving new input for my research.

All'Erva Radicchia has not yet been performed publicly and I am currently organising a public performance of the piece and identifying ensembles and spaces that might suite the composition well. However, the trial sessions showed positive results in reproducing the sonic environment of Calabrian bells. The listener can engage with the sound of specific bells and follow them as they move. The sound coming from different sources and propagating throughout the performance space recalls that of goat flocks in the pastures.

5.5 Summary

This chapter reflected upon my composition practice and demonstrated how the ethnomusicological research informed the creative process. The music I composed during the doctorate investigated some fundamental features of Calabrian folk music. Most of the pieces are composed with a nucleus of limited musical materials, thus reflecting the economy of musical resources described in Calabrian music. The analysis of the traditional *sunata fina* informed the process of extemporary variation that I developed in my saxophone solo. In *Bad Habits*, the variation through iteration of a not-completely-determined musical cell, observed in Calabrian micro-variation, is translated into an improvisation process. A mixture of determined musical elements and a series of mobile parameters set the framework for improvisation through the constant iteration and modification of the given materials. Similar processes are explored in other compositions, especially in relation to ensemble interaction. *High and Subtle* expands on the variation of a basic cell by creating a mobile mode for the musicians to construct a network of interactions. *Into the Pipe* adopts the repetition and variation of a module in the second movement; the performers transform the cell by variating pitch and tempo. *Alla Berlinota* and

All'Erva Radicchia explore the deep interrelation of fixed and variable elements by introducing elements of controlled improvisation and indeterminacy, so that the musical content varies ever so slightly although preserving a clearly defined identity.

The explorations of the bagpipe tuning system and process led to the experimentations with microtonality and shifting harmonic spaces. The tuning process translated into a mono-directional musical form in which a clustered harmonic space is directed towards an order made of quantised pitch relationships. The emergence of a tuning system widely adopted for the *surdulina* led to the composition of just intonation music. In *Alla Berlinota*, the harmonic relationships of pitches of the *surdulina* are explored through a series of chords constructed with partials of a common harmonic series.

The study of Calabrian soundscapes and animal bells translated into a composition for 6–23 goat bells. In *All'Erva Radicchia*, the spatial representation designed by flocks and the unpredictability of the animals' behaviour is translated into spatialisation and indeterminacy. By drawing on different techniques, this piece offers listeners to establish aural relationships with the bells as they shape the soundscape of the performance space.

Chapter 6
Conclusion

This dissertation has explored ways of embracing fundamental features of folk music in a practice for contemporary music. The leading methodological principle of this investigation has been Béla Bartók's suggestion to absorb and master the folk music idiom as if it was the composer's mother tongue (Bartók 2010). This research was driven by an ethical imperative: the avoidance of a superficial approach to Calabrian music in order to prevent a colonialist or an exoticist view of that culture. This study aimed at a careful understanding of Calabrian music's idiosyncrasies through a thorough investigation of its fundamental principles. This led to an investigation with and among the actors of that musical tradition. By studying Calabrian material and immaterial culture, the enquiry aimed at understanding the aesthetic, poietic, social and symbolic context in which that music is produced. Consequently, such a study required the adoption of the mixed research methods that I described in Chapter 2. Ethnography-derived disciplines set the methodological framework for the investigation into folk music. The study of sound was conducted according to the conceptual framework and analytical methods of acoustemology. This study concerned the perception, production and symbolic signification of sound in Calabria, as well as the investigation of the composite network of relationships it initiates among humans, non-humans, and landscape. To study Calabrian music, I resorted to ethnomusicological and sound-analytical methods; supported by ethnographic research, this enquiry aimed to comprehend the emic approach to the phenomena under investigation. Interviews, participant observation and participant listening were primarily concerned with understanding the cultural processes that govern folk music, and with discerning the natives' perspective.

Auto-ethnographical reflections contributed further insight into the cultural processes at play in folk music. These passages provided an account of significant moments of my folk music training and of my participation in the musical life of Calabria: they supported the scholarly analyses in deciphering the cultural processes associated to folk music-making.

Through the combination of methods described above, I investigated mainly three fundamental aspects: generative principles of dance music, the tuning system and process of *surduline* bagpipes, and the use of bells for herd animals in the region. I studied the generative principles governing Calabrian music by analysing dance music recorded in the region. I cross-checked my analyses with data emerging through ethnographic interviews and auto-ethnographical reflections in order to grasp the emic theory of the music. Those investigations brought to light a system based on the continuous repetition and transformation of short musical fragments, in which each occurrence is a different actualisation of an underlying formulaic principle (Treitler 2007). The study of *modular micro-variation* also brought to light a peculiar way in which Calabrian musicians perceive the repertoire. The identity of a *sunata* is defined by some characterising elements; as long as they are preserved, the system can be varied without losing its defining character. I explored these principles in the saxophone solo discussed in Section 5.1. In *Bad Habits*, I translated Calabrian *extemporisation* into the context of contemporary improvisation. The music is constructed through the perpetual repetition and *micro-variation* of short musical fragments that work as formulaic principles. The fragments define the fixed elements to be transformed through a set of given parameters. My focus was on recreating the balance between transformation and stability observed in folk music. I tried to reproduce the action of the two forces described by Tullia Magrini (Magrini 1988): on one side a centripetal, stabilising force which anchors the performer to the music materials and the given parameters; on the other side a centrifugal, destabilising force, pivoting on the performer's creativity.

I also investigated the same concepts and techniques from the point of view of ensemble interaction in other compositions, such as *Into the Pipe* and *High and Subtle*. In these works, modules define a framework for ensemble improvisation, as *micro-variation* relies on interplay among the performers. The same concepts are also explored in relation to more determined musical materials in *High and Subtle,* discussed in Section 5.2. Besides being extended into a platform for controlled indeterminacy, they also informed the elaboration of variation techniques for determined composition, which expanded on Bartók's polymodality and Forte's pitch set theory.

The investigations of bagpipe tuning, discussed in Section 3.4, brought to light a culturally informed process that appears to work as a musical repertoire. In such a

process, the disordered harmonic space of yet-to-be-tuned bagpipes is slowly pushed towards the quantised order of the fully tuned instrument. The analyses also showed a tuning system based on simple harmonic ratios derived from the superimposition of pure intervals based on the harmonic series of the two tonal centres of attraction of the instrument. The directional form of the tuning process, moving from harmonic disorder to order, informed the composition of three pieces that I discussed in Section 5.3. *No Dance Otherwise*, for string quartet, explores ever-changing harmonic relationships in a rather determined composition in which the harmonic tensions are resolved at the end of the piece. The tensions are investigated through custom notation and microtonal harmony in a continually shifting harmonic space. *Into the Pipe* explores the shifting harmonic relationships by interweaving written music and framed improvisation. The musicians rely on verbal instructions and interplay for the production of a disordered harmonic space that resolves the tension in written fragments of music. In the second part, this piece also explores variation and modularity. By following verbal instructions and relying on interplay, the performers are asked to constantly vary a *girata* of bagpipe music in an iterative process. The third piece, *Alla Berlinota*, explores the tuning process in a context of just intonation. This composition utilises the harmonic ratios described in the analyses of bagpipe tuning, coupled with rhythmic transcriptions of a *sunata* for bagpipe. A second part investigates the simple harmonic ratios in a chorale built from chords found on the bagpipes. A third part recreates the interweaving of lines of the bagpipes.

Research on animal bells and Calabrian soundscapes showed a complex system of symbolic signification associated to sound. That enquiry also brought to light an intricate network of relationships initiated by sound. Clearly defined aesthetic choices drive the way flocks are tuned and consequently shape the soundscape of the community. Beyond the mere functional use of bells, shepherds create a sound that is pleasurable and meaningful by drawing on their extremely refined aural skills. I explored the outcomes of these investigations in *All'Erva Radicchia*, a piece for goat bells. This composition reproduces the indeterminacy and unpredictability of the movements of the animals in a flock. Through spatialisation, it invites the listeners to establish aural relationships with the bells and follow their sound as it moves across the space. The unpredictability of the animals' behaviour is explored through indeterminacy techniques. Indeterminacy

introduces an element of variation that makes the music different at each performance, although it still preserves a very defined and recognisable character.

All the compositions also explore the balance between stability and variability observed in the study of the Calabrian generative principles. The scores often offer a framework for the performers to creatively relate to. They are designed so to allow agency within a specified framework and stand for the model to which folk musicians refer to in their performance. The performers are invited to establish a dialectic relationship with the score in accordance to their taste, skill and personality by adhering to the given materials and methods. These scores only partially define the musical output and leave open some aspects for variation to occur during performance. The music is thus performance-oriented, as it changes, even if slightly, at each new performance, yet maintaining its specific and recognisable character.

The research described in this thesis contributes to both areas of investigation involved. The research I conducted on Calabrian music provides a valuable contribution to the study of the musical phenomena of the region. My analysis of the variation process of Central Calabrian dance music, offers a new perspective on micro-variation and on the defining principles of *sunate's* identity. I believe my work contributes to the study of generative principles and formulaic music around the world by providing a new perspective on variation and repetition. In my research of bagpipes, I offer an innovative interpretation of the of the tuning process and tuning system, as well as of the related cultural phenomena. This study is innovative in that it draws on psychoacoustics and considers the emic perception of the harmonic space. The ethnomusicological research, focused on the emic theory of music and approach to sound, focused on the peculiarities of Calabrian music and its unique character. However, I believe that my analytical approach offers valuable methodological inputs to the study and analysis of other musical cultures.

The work accomplished through my practice-led research can be inscribed in a legacy of creative investigations into contemporary composition and improvisation. My research offers a contribution to the creative use of folk sources into contemporary music-making, provides an insight into new techniques for music variation and demonstrates new ways of creatively engage with a culturally derived approach to sound. In Section 5.1.1 I discussed the instrumental solo as a platform for musical experimentation, a common practice among composers and improvisers. *Bad Habits* draws on a variety of sources and offers a new contribution

to the practice of solo music. Traces of Anthony Braxton's solo language as well of his *Language Types* can be found in my playing. Both Braxton's and my research focus on fundamentals of the musical discourse, although they investigate different levels of musical creation. Whereas Braxton's *Language Types* explores the types of musical materials that can be adopted in performance, my work reflects primarily on a process for transforming and varying basic musical materials. Similarities can also be found with the work of Evan Parker. Some techniques I adopt in my playing appear to be similar to those developed by the British saxophonist (Parker 1992). Furthermore, Parker cites pibroch piping as an analogy for describing the accretion process he devised in the "score" [sic] of his piece *De Motu*. However, he identifies the source of his variation principle in machines behaviour, "fractal patterns and Mandelbrot figures". In my music, variation is entirely rooted in a single idea derived from folk music: that is, reproducing the generative principles of Calabrian dance music, bagpipes playing above all. Furthermore, my exploration of these principles goes beyond the realm of improvisation as I use them also for generating the written score of High and Subtle.

My work on Calabrian soundscapes offers a new perspective on the use of animal bells in contemporary music practice. Composers have used animal bells in their works and also included the animals in their performances. Examples include Misha Mengelberg's *Le Musiche della Città*, presented at the Italian theatre festival Santarcangelo dei Teatri in 1978 and Yannis's Xenakis's *Polytope de Mycenae* (1978). Both composers included a flock of sheep with bells in their performance. The Dutch composer's use of animal bells could be interpreted in the perspective of a situationist multi-cultural meeting, as it can be inferred from the brief description given in the program – "A group of jazz improvisers, three marching bands, a liscio orchestra, accordions, bells"[34] – and from the published pictures of the event.[35] Xenakis's *Polytope* is a situated performance that builds on the space and sound of the historic site with a composite art event that includes percussions, synthesisers, animals, people, space and light (Schiffer 1978). In my piece *All'erva Radicchia*, the sound of the flock becomes the essence of the musical discourse, a platform that enables the listener to engage in a dynamic relationship with space and sound

[34] Original: "Un gruppo di improvvisatori jazz, tre bande, un'orchestra di liscio, fisarmoniche, campane". The digital version of the flyer can be found at the following address: https://drive.google.com/file/d/0B_p_g0TtF0RsakF1OFo2VDZnRzQ/view

[35] For instance, those published by Enrico Scuro on his website: ttps://enricoscuro.it/archivio-anni-settanta/raduni-giovanili-anni-70/festival-internazionale-teatro-piazza

through the tolls of animal bells. The bells do not simply evoke space (imaginary or real) but speak musically in their own right. *All'erva Radicchia* can be compared, to some extent, to Steven Feld's *The Time of Bells* (Feld 2004a; 2004b; 2005; 2007; 2012) insofar it attempts to convey, although in performance, a culturally informed approach to sound and space (Robair 2006). The creative research on bagpipe tuning has been informed by the work of practitioners who research harmony and explore an extended harmonic space, such as Marc Sabat, James Tenney and Chiyoko Szlavnics. In *No Dance Otherwise*, *Into the Pipe* and *Alla Berlinota*, I applied these experiences to the exploration of a culturally defined harmonic space and the syntax of the *surduline* bagpipes, and to the Calabrian bagpipers' approach to tuning. Overall the research shows an innovative way to engage creatively with the work of others. It also shows how the values and creative processes of a musical culture can contribute to the advancement of contemporary music.

The work presented here has demonstrated a way of creatively approaching the analysis of folk music, and related cultural phenomena, that goes beyond the mere adoption of melodies or instruments. The concepts, techniques and musical materials that emerged in the ethnomusicological enquiry offered new ground for explorations in contemporary music. This approach to musical research celebrates diversity by respecting the idiosyncrasies of these two musical languages, yet offering new solutions for establishing connections and dialogues. I believe I conducted research in a way that respects the poietic and aesthetic frameworks of both musical realms involved. The result is far from creating a world-music fusion of styles, but is rather a creative enquiry entirely conducted in the realm of contemporary music, in respect of its experimental approach to music-making that seeks for a critical questioning of established practices.

The techniques, processes and materials developed in this research are not bound to a specific musical genre. This enquiry is conducted in contemporary music, although I believe that the findings are *trans-idiomatic* and can therefore be extended to all musical realms, regardless of genre and audience platform. Furthermore, although this enquiry focused on folk music from Calabria, a similar approach could be applied to any musical culture, as long as the research is thorough and abides by an ethic of respect and dialogue.

6.1 Further work

The work presented in this dissertation is the initial stage of a broader musical research programme, and represents a first step into the adoption of folk musical elements in my creative practice. As ongoing work, many aspects of this relationship are still to be explored. More work will be conducted both in the areas already investigated and in new ones. Further research into Calabrian music will raise new questions and bring to light new phenomena which could feed into the creative research. Repertoires and techniques are still to be investigated in the region and they will provide new ground for the creative explorations.

The investigations of *modularity* and *micro-variation* conducted in *Bad Habits* work on a balance between fixed and extemporised materials. As I developed this solo practice, I was able to establish a tradition of my own playing. Hence, I was able to embody the musical materials, and the techniques for varying them. However, it is yet to be proven whether different performers will be able to reproduce a similar balance of extemporised and fixed materials. Similarly to folk music, improvised music lives through orality and relies on a “tradition” set by the previous experiences of the performer (Lewis 1996; Parker 1992) or of different performers. Whereas in folk music the conveyance of new values and techniques is dependent almost solely on orality, in improvised music, recordings partially take over that function.[36] This is especially true for practices yet to be established, or when learners seek to assimilate music by performers who are not present or accessible to them. The score alone is probably unable to communicate clearly the musical content of each composition. In order to be decoded, it requires the performance – live or recorded – or a very clear knowledge of the underlying processes. To succeed and reproduce the balance between conservation and variation, the performers should know and share the music system in which the performance was produced. Further research into this problem will concern the transmission of the techniques and processes, in an attempt to establish a tradition that can be shared with and developed by other musicians.

[36] For a discussion of the role of recordings in forming traditions of improvisation in "folk" contexts, see Blum 1998, 40n1: "It is not uncommon for ethnomusicologists to observe that “recordings of apparently ‘spontaneous’ improvised African music reveal a consistency of performance which suggests that the musicians hold in their heads both the grammar of a musical system and the equivalent of a musical score.”

Research on *modularity* and *micro-variation* in ensemble settings and group improvisation will also be developed further. In *High and Subtle* and in the second movement of *Into the Pipe*, I explored those processes in settings in which the whole ensemble works on similar materials, or materials that are strictly related to each other. New research will investigate the layering of different orders of materials. Future works would also explore *modularity* in just intonation music, thus expanding on the explorations initiated with *Into the Pipe* and *Alla Berlinota*.

The work done with bagpipes covered important aspects of the instrument's tuning; however, more remains to be done. The *Contemporary Improvisation Workshop* that I directed at the Reid School of music performed an arrangement of *Into the Pipe* for 13 musicians. The investigations of a shifting harmonic space showed great potential for extending that part of the research to large ensembles and orchestras.

The study of *surduline* tuning could be extended to *a paro* and *stifette* bagpipes, which show different recurring tuning systems. Further ethnomusicological research into bagpipe music could provide new directions for creative investigation. Research could include music functional to movement and grazing; the study of the improvised interactions between singer and piper in vocal repertoire; a "suspensive" (La Vena 2005) feature of some of the repertoire for *conflentana*, a music that never resolves tensions onto the tonic; and the meditative and repetitive character of sacred bagpipe repertoire. All these aspects would instigate new directions to investigate.

The study of tuning could be extended also to other instruments, such as the bark flute (overtone flute), the *lira Calabrese*, and also include an investigation of vocal repertoire. Calabria has a vast repertoire of vocal music and vocal practices, from monodic to polyphonic music, both accompanied and unaccompanied. Such a diversified repertoire could provide data for an extensive creative investigation of Calabrian melody and polyphony.

The work conducted on bells and Calabrian soundscapes offered new stimulus to the investigation of aspects of the Calabrian sound environment. Sound holds an important role in Calabria. Many laic and religious rituals are associated to sound and specific sounding objects. For instance, Holy Week is characterised by the eerie sound of clankers and shakers that symbolise death. Sounding objects, often self-made from cane, wood or scrap materials, are used as toys for children. Clappers, bangers, reeds and other sounding objects design a rich sound environment.

Further research would investigate such a complex and differentiated soundscape. These investigations could offer new stimuli for advanced research on music for non-professional musicians. As *All'Erva Radicchia* is written for performers with no specialised musicianship, new research would expand the composition of music for non-professional musicians. Through the development of bespoke improvisation, composition and performance strategies, these pieces would create an inclusive platform for music performance that draws together professional and non-professional musicians. They will also encourage people who often feel they are not musical to get involved in all aspects of music-making. Besides expanding the audience of contemporary music, the direct involvement of non-musicians in music-making may have pedagogical implications with a positive impact on music tuition for the young and for adults. This new research may also contribute to teaching improvisation to infants, children or adults, and could be implemented into community music and other programmes for amateurs and non-improvisers.

As some of the pieces composed for this research have not been publicly performed yet, in the immediate future I will focus on promoting the performance of *No Dance Otherwise, Alla Berlinota* and *All'Erva Radicchia*. I will identify ensembles and festivals that could be suited for these compositions and organise their performance.

Appendix. Dissemination

Album released:

Bad Habits

AutRecords (AUT032)

Christian Ferlaino: alto sax

Tracklist

1. *Le cattive abitudini dello zampognaro* – 06:13
2. *All Work and No Play* – 02:06
3. *Cutting Grace* – 02:26
4. *It Doesn't Take Much* – 02:25
5. *The Four Bass Hierarchy* – 01:55
6. *The Thesaurus of Musical Invective* – 02:33
7. *Right?* – 03:48
8. *All's Well That Ends Well* – 05:35
9. *The Jaw Trick (for Nicola*) – 03:52

Date released: 14 November 2016

Recorded between October and December 2015 in Studio 1 at Alison House – Reid School of Music, Edinburgh.

Mixed and mastered by Roberto Rettura at Studio Spaziale, Bologna.

Artwork by Mivia Bonadiman (Pánícó)

Graphics layout by Laure Catugier

Produced by Christian Ferlaino and Aut Records in 2016

Major performances of musical works:

Bad Habits:

- Resilienza, Bitonto (IT) 23 December 2017.
- Gramigna, Bari (IT), 22 December 2017.
- Gusto Vinile, Brindisi (IT), 21 December 2017.
- Sound Though Festival, Glasgow (UK), 31 March 2016.
- Reid and Red 2016, Assembly Roxy, Edinburgh (UK), 27 April 2016.
- Somewhere There Second Sundays Series, Array Music, Toronto (CA), 8 May 2016.
- AutFest, Acud Macht Neu, Berlin (D), 12 November 2016.
- Zaal 100, Amsterdam (NL), 24 January 2016

High and Subtle:

- Reid and Red 2017, Assembly Roxy, Edinburgh, 13 May 2017.

Into the Pipe:

- Solaris Saxophone Quartet, Salon de Ijzerstaven, Amsterdam, 18 June 2016.
- R. MacDonald, G. Wilson, T. Krekels, C. Ferlaino, Concurrent Festival, Edinburgh, 13 January 2017.
- Ostravská banda, Ostrava Days 2017, Ostrava, 24 August 2017.

Conferences

Bagpipes as a resource for contemporary music:

- *Creating Music Across Cultures in the 21st century*, Istanbul Technical University, Turkey, 26 May 2017.
- *Reid School of Music PhD Symposium*, University of Edinburgh, UK, 13 June 2017.

Melodic formula and modular micro-variation:

- *The Improvising Brain III: Cultural Variation & Analytical Approaches*, Georgia State University, USA, 27 February 2017.

Solo saxophone informed by the grammar, syntax and vocabulary of South-Italian folk music. (Performance)

- *ISIM, 9th Festival and Conference*, Wilfrid Laurier University, Waterloo, Canada, 12 May 2016.

Animal bells. Beyond functional:

- *Research in practice: creative engagement with the material of others*, University of the West of Scotland, UK, 18 May 2018.

Lectures

- *La musica da danza nell'area del Reventino*, Università della Calabria, Cosenza, 5 April 2016
- *Suoni e Danze della Tradizione Locale*, Biblioteca Comunale, Nocera Terinese, 23 December 2016
- *Conservazione e trasformazione nella musica di tradizione orale*, Felici e Conflenti, Conflenti (Italy), 28 July 2016

Publications

- *Alcune Osservazioni Sulla Danza Nell'area Di Influenza Della Madonna Di Conflenti*, in *Paesaggi culturali di Calabria. Percorsi Interdisciplinari*, edited by Mauro Francini, 1, 0/2018, Collana Culture dell'Abitare, Rubbettino Editore, 2018, pp.165–176. Publication type: book chapter. Observations on folk dance in Central Calabria. Language: Italian.

- *La Musica Da Danza Nell'area Di Influenza Della Madonna Di Conflenti*, Rubbettino Editore, Collana Università, 2017, pp. 98, 65 audio tracks. Publication type: monograph with CD. Research on dance music for accordion and bagpipes in Central Calabria. Language: Italian.
- *Musiche Tradizionali Nell'area Del Reventino-Savuto*, Bressi A., Di Toma G., Ferlaino C., Nitti G., F&C001, 2017, pp. 20, 22 audio tracks. Publication type: booklet with cd. Research on instrumental and vocal repertoires in the surroundings of Mount Reventino and River Savuto, Calabria. Language: Italian, English.

Submitted

- *Generative principles of dance music in Central Calabria*, *Analytical Approaches to World Music Journal*, pp. 45. Received reviews and resubmitted to the journal. A discussion on the modular micro-variation principles observed in Central Calabria.

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